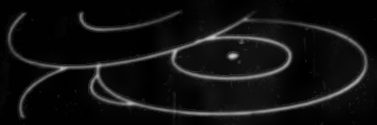
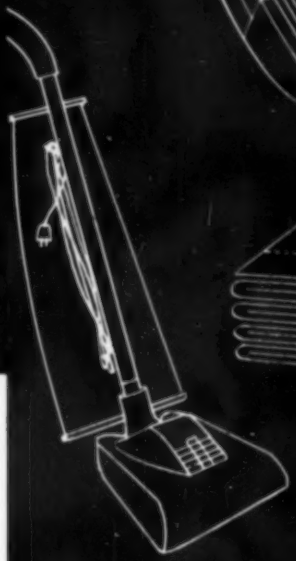
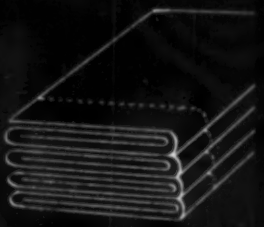
Consumers' Research

BULLETIN







MAY • 1955

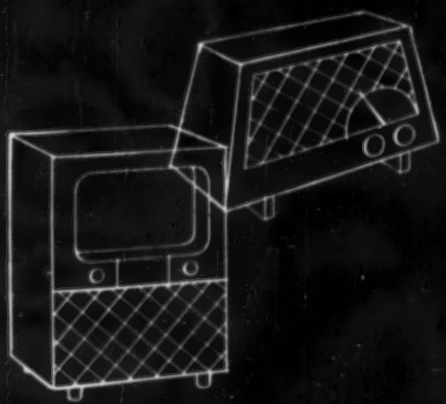
Automobile Polishes and Waxes . . . 5

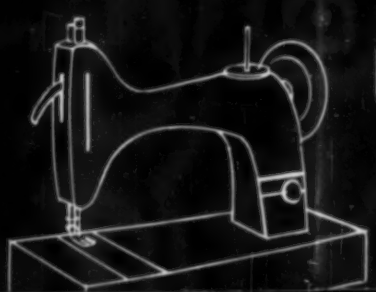
Hearing Aids 10

Television Antennas 19

Mail-Order Photofinishing Services . . . 25

COMPLETE CONTENTS ON INSIDE FRONT COVER





Consumers' Research Bulletin

MAY 1955 VOL. 35 • NO. 5

Automobile Polishes and Waxes 5

Transistor Hearing Aids 10

Television Antennas for Fringe-Area Service 19

Mail-Order Photofinishing Services 25

Miscellaneous

"All About Trailers"— a book review 27

The Ball-Point Pencil, and a fountain pen with a new feature 28

Caulking Compounds 29

Features

Off the Editor's Chest 2

The Consumers' Observation Post 3

Brief Cumulative Index 18

Ratings of Motion Pictures 31

Phonograph Records — *Walter F. Grueninger* 35

Consumers' Research functions to provide unbiased information on goods bought by ultimate consumers. For their benefit (not for business or industry) and solely with the funds they provide, CR carries on tests and research on a wide variety of goods, materials, and appliances, and publishes the findings in CR BULLETIN. Consumers' Research is a non-profit institution, and is organized and operates as a scientific, technical, and educational organization.

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OFF THE EDITOR'S CHEST

THE consumer has often been the guinea pig for new products or new features of old ones, but of late he has begun to take on a role of greater importance. It is rapidly being discovered that he probably makes the whole economic system tick.

Recently a high administration official observed that since most American families are able to buy many more things than actual necessities, they are in a position to postpone or cancel a number of their ordinary purchases. When they do refrain from buying, there is a recession of business like the one in the automotive trades this past year. This slump in sales had far-reaching effects, including unemployment in automobile, machine tool, automotive parts and equipment factories. Thousands of small retailers also suffered losses.

Just why people failed to buy as many cars as usual is still something of a mystery in spite of the fact that predicting how consumers will act has become an important field of activity for economic advisers, fortified with graphs, charts, and tables of statistics. There have been so many wrong guesses and predictions by the so-called experts in this field during the past decade that it has been fashionable to refer to them as "crystal gazers." Obviously it is desirable to anticipate people's decisions to buy or not to buy certain commodities, but whether the consumer can be effectively put under the microscope is a question. The social scientists are getting into the act with studies on consumer behavior and attitudes. Conferences are held to discuss techniques of reporting and evaluating what consumers say they are going to do.

Since the consumer can pretty well stop the wheels of commerce if he chooses—or if he fails to choose—the experts should be encouraged to discover what mechanism can be provided for recording his discontent ahead of time. Right now all the consumer can do is to sit on his pocketbook at times, and that can certainly upset the economic applecart.

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It will be advantageous if you will, whenever possible, send prompt notice of change of address at least 5 weeks before it is to take effect, accompanying your notice with statement of your old address with name in full. At least a month's notice must be given in any case. ¶This rule, however, regarding long advance notice does not apply to military personnel. *CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.*

Symbols used to indicate sources of data and bases of ratings: **AA**—regarded as worthy of highest recommendation; **A**—recommended on basis of quality; **B**—intermediate with respect to quality; **C**—not recommended on basis of quality; **cr**—information from Consumers' Research's own tests or investigations; **1, 2, 3**—relative prices, **1** being low, **3** high. Note that price and quality are completely differentiated in CR's listings; **a quality judgment is independent of price**; **54, 55**—year in which test was made or information obtained or organized by the staff of Consumers' Research.

The Consumers' Observation Post

SPRING IN THE COUNTRY and suburbs brings forth a number of rackets operated by fly-by-night shysters who prey on the gullible public. The Santa Barbara Better Business Bureau lists a few of these gyps as "wonder flowers" from unknown mail-order houses, fake humus peddlers, "controlled" grass seed, itinerant roof and gutter repairmen, itinerant tree trimmers, and furnace repair fakers. The Bureau recommends dealing only with firms whose dependability can be established by intelligent inquiry, signing papers only after reading and understanding terms and conditions of sale, insisting that promises be put into writing (and retaining a copy), paying the bill by check or money order made out to the firm rather than cash to a salesman.

* * *

READING THE LABELS OF CANNED FOODS before making a purchase is essential these days for people with food allergies. The substances permitted to be added to a simple product are numerous. Currently, it is proposed to permit the use of monosodium glutamate as an optional seasoning ingredient in canned vegetables. This is a fairly new seasoning, or artificial flavor-improver, and the extent of its allergic manifestations has therefore not been explored. The unhappy experiences of two people from its use were reported in the March 1955 Observation Post.

* * *

MOTHPROOFING CARPETS AND RUGS made from wool combined with synthetic fibers, such as cellulose acetate, viscose rayon, nylon, and other man-made fibers, is sometimes a problem. The first record of damage to synthetic fibers, according to the National Pest Control Association, came from a fumigation in which liquid HCN (hydrocyanic acid) came in contact with a rug of cellulose acetate pile fiber. The fibers were softened and fused at the tips, permanently affecting the appearance of the rug. Subsequent tests by the Association in cooperation with several carpet manufacturers indicated that some 20 commercially available insecticide formulations in common use even when applied in excess using concentrations double those commonly used produced no injury to the synthetic fibers. Mothproofing by a competent firm should be entirely safe at the present time.

* * *

THAT FIZZ IN SODA POP may be due to the use of saponin, a derivative from the bark of an evergreen tree that possesses the property of frothing with water. It also has the unfortunate effect of hemolyzing or dissolving blood corpuscles. It is considered quite undesirable for use in carbonated beverages, but unfortunately some state Pure Food Laws do not specifically prohibit its use for this purpose. The Federal Food and Drug Administration does not prohibit the use of saponin in beverages but permits manufacturers to use it on their own responsibility. In Connecticut, tests of a number of beverages reported in October 1954 showed that several brands of root beer, root beer concentrate, and certain products variously labeled as "Creamy Foam Type Beverage Base," "Soda Foam," "Foam Blender," and "Artificial Foam," contained saponin. The Connecticut authorities took the view that any beverage or foaming agent containing a hemolytic ingredient such as saponin is adulterated within the meaning of the Connecticut Food, Drug, and Cosmetic Act. It will be wise for health officers alert to protect their citizens' health to follow Connecticut's example.

* * *

EVERY HOMEMAKER WILL SOON BE DISSATISFIED with her present kitchen if General Electric's program for a "modular" kitchen takes hold. According to the publicity for a GE kitchen-planning study, the American housewife needs a more livable kitchen which should be a colorful, pleasant place for fam-

ily living. The new GE kitchen center is designed around one giant fuse box, and all new GE appliances are to be opened from the front for servicing and repairs so that they will not need to be removed from the unit center to repair or replace parts. This feature is also scheduled for the new built-in lines of appliances. The appliance retailer has been warned that he will need to be a salesman, plumber, electrician, and junior home decorator to put over the new program successfully, which entails selling an entire new kitchen with matching and usually colored appliances. Even matching paints are available for painting wooden cabinets, walls, and ceiling in the five GE mix-or-match colors. Whether the family will prefer the kitchen to the room in which the TV set is installed is something that only time will tell. Perhaps the trend toward eating off small tables in front of the TV set in order not to miss a favorite program is losing its appeal.

* * *

MEN'S WASH-AND-WEAR SUITS are scheduled to be widely advertised this coming season. One large manufacturer points out that for best appearance such suits should be pressed. The chief objection to the synthetic suit made from Dacron, according to a prominent men's wear merchant in New York City, is "pilling" of the fabric. Recommended washing instructions for Wash-and-Wear garments include hand washing in lukewarm water in soap or detergent, rinsing and drying without wringing. Trousers should be hung by the cuffs and the coat should be hung on a wooden hanger with a washcloth padding under each shoulder. If ironing is necessary, the iron should be set at very low heat, synthetic, nylon, or rayon setting. These garments can also be dry cleaned by the conventional method, if desired.

* * *

PACKAGED MEAT has had a certain popularity, but there are a number of objections to it. According to a news item in The Wall Street Journal, women want to see both sides of the meat they are buying and are annoyed when they find bones and fat hidden by the cardboard container. Some women report that the packaged meat takes on the flavor of the cardboard. They would like to see meat packaged in wrappings that are transparent on all sides, the date on which the meat is packaged stamped on the wrapper, and a greater variety in the weights of the packages offered.

* * *

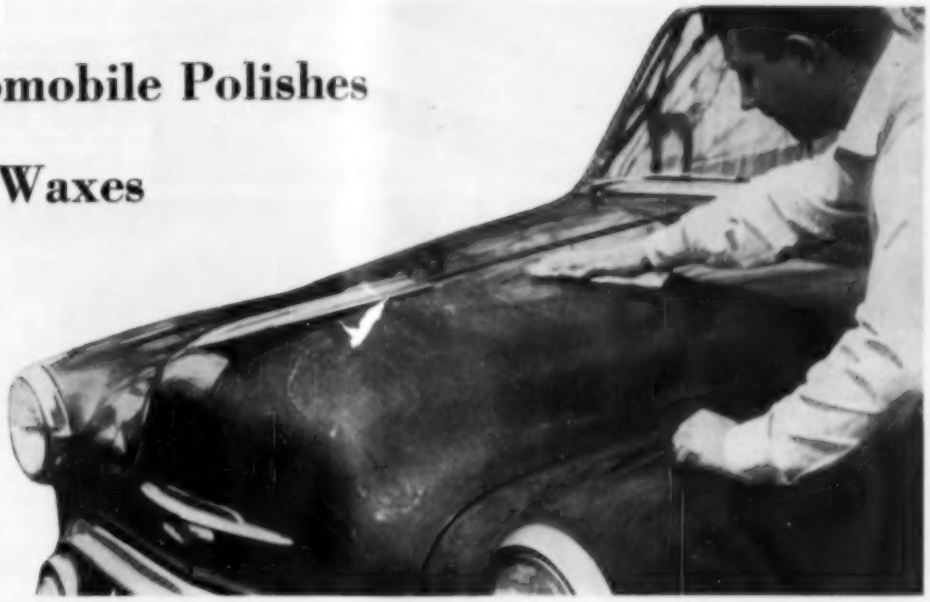
HEAVY COTTON FABRICS, sometimes sold as winter cottons, are appearing in increasing numbers on drygoods counters and in ready-made dresses. Whether they are washable or should be dry cleaned is being studied in a research project set up at the College of Home Economics, Cornell University, under the supervision of Professor Evelyn Stout. Of nine fabrics sold as winter cottons, one was found to be a blend of rayon and acetate. One fabric had a disagreeable odor, retained that odor after 20 dry-cleaning treatments, and its color faded when it was exposed in a Fade-Ometer to simulate exposure to the sunlight. The fabrics that had been labeled crease resistant were found to live up to that claim throughout the study although their resistance to creasing was not as good at the end as at the beginning of the study. The amount of shrinkage was satisfactory in seven of the nine fabrics.

* * *

CENTURY METALCRAFT CORPORATION, which deals in kitchen utensils, has been the subject of a suit by the Department of Justice for violations of a 1940 Federal Trade Commission order. The F.T.C. ordered the corporation to cease and desist from representing that doctors or hospitals have endorsed its utensils unless the endorsing is done by the doctors or dietary experts or by hospitals acting through their dietary experts. The order also forbade the company to circulate disparaging statements concerning its competitors, to claim that its utensils will not pit, that the method of cooking made possible by the utensils is new and revolutionary, and that the use of the food cooked in such utensils will insure improved health. The suit brought at the request of the F.T.C. by the Department of Justice asks

(The continuation of this section is on page 33)

Automobile Polishes and Waxes



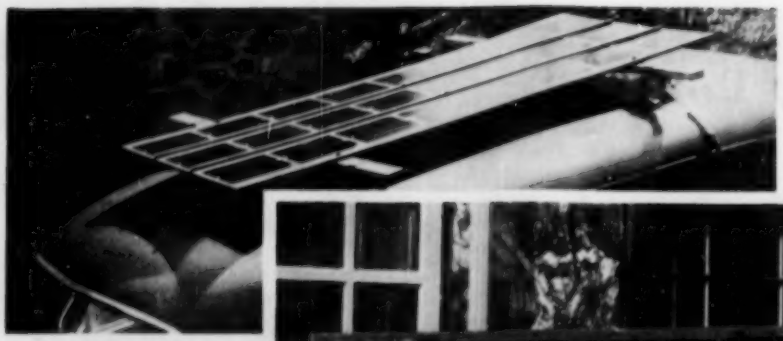
ALMOST every automobile owner would like to protect the paint on his car and maintain its good appearance. Besides the sense of satisfaction that goes with a well-groomed car, regular care is a practice that is worth while, if one plans to keep the car for a number of years. With proper care, the deterioration due to weather exposure can be kept to a minimum. Caring for the finish of a car is simple, if one knows a few basic facts and is willing occasionally to put in some hard work in washing, polishing, and waxing.

The first thing to know is which type of paint your car has, whether lacquer or enamel. If you have a *Buick*, *Cadillac*, *Chevrolet*, *Hudson*, *Oldsmobile*, *Packard*, or *Pontiac* automobile, your car is finished with lacquer. The 1955 *Hudson* has enamel; *Lincoln* uses some enamel, some lacquer. Other American cars will have enamel. Basically, these finishes differ in the manner in which they dry after application at the factory or paint shop. A lacquer dries simply by evaporation of the solvent used to apply it, and, since there is no chemical change taking place, the dried and hardened paint can be redissolved at any time by the solvent. An enamel, on the other hand, requires oxygen from the air to produce a hard surface; this involves a chemical change, and it is therefore not subject to being redissolved by the solvents once the coating has hardened.

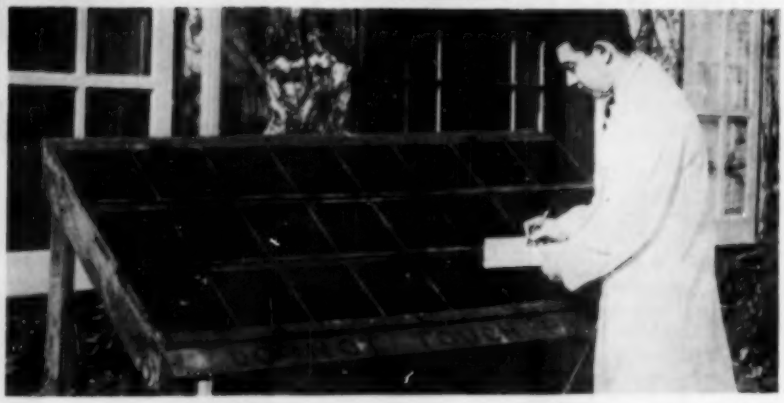
Knowing which of the two types of paint your car has can be important for future cleaning and polishing, particularly when one is using a solvent for removal of tar, etc. From the owner's standpoint, there is no essential difference in the durability of a lacquer and an enamel if each is taken care of at regular intervals or as required. A car with a lacquer finish has either three or four coats measuring altogether about two thousandths of an inch in thickness, whereas an enamel coating is about three thousandths of an inch thick. There is little difference in thickness of coating on a low-priced car, as compared with a high-priced car.

While car manufacturers claim that today's paints will last as long as the car, the owner must realize that a layer of paint two to three thousandths of an inch thick will not stand much abuse from the brushing of twigs of trees and bushes, or from sunlight, dew, dirt, chemicals—or the abrasion involved in frequent use of cleaners and polishes. It is advisable, therefore, to use a polish only when it becomes necessary, being sure the product used for cleaning is not too abrasive. The polish should be capable of removing the "dead" or chalked layer and restoring the original luster and color without taking off paint that is still in good condition. To provide long-lasting protection, a wax or glaze should be applied immediately after polishing to delay subsequent chalking and loss of luster and color.

With a new car having a lacquer finish, at least 30 days should elapse from the time the car is painted until it is polished or waxed. This



The exposure tests of automobile polishes and waxes were carried out on the test panels illustrated. The ones illustrated in the top picture are lacquer panels; those below are enamel.



During the six months' exposure test to the elements, test panels were interchanged every two weeks, from the top of CR's station wagon to the sloping rack, out of doors. At the end of each two-week period, the test panels were washed with sponges and clear cold water, and gloss readings were taken.

will allow the paint to reach its full hardness. To avoid premature failure of the film by chalking or checking, it is best not to polish or wax a car that has an enamel finish for at least the first three to six months of the new car's life.

One of the most important steps in preserving the finish is to wash the car frequently, as often as once a week. This requires nothing more than plain cold water and a cellulose or natural sponge or soft cloth, followed by thorough drying of the car with a chamois or soft towel. Never wash the car in the direct rays of the hot sun. Do not start washing a car until the metal surfaces have cooled off. If dirt and road scum are left on the finish too long, the paint will eventually become dulled; likewise spots left by birds and resinous droppings from trees will hasten dulling of the paint. The car should be flushed thoroughly with water before washing, to remove the loose dust, mud, and abrasive particles.

The use of a detergent should be kept to a minimum, and when one is used, it should be rinsed off thoroughly with *running water*, if a hose stream is available. A detergent can help in the washing operation preparatory to polishing, but when a protective coating of wax or one of the proprietary coating materials has been applied to the finish, it is best to avoid using a detergent, for even as few as three or four washings with a relatively mild detergent solution will remove almost all the protective coating, leaving the lacquer or enamel coating exposed to the weather. It is never safe to wipe or dust a car with a dry cloth, or sponge, or to use a cloth advertised as suitable for "dry dusting" of a car; such a method is bound to be harmful to the finish, through the rubbing in of grit.

Occasional polishing, say once every 12 months, or as needed, will remove any chalking that may have occurred and at the same time restore the luster and color. Chalking or "dead" paint can be detected by wetting a finger or cloth and rubbing the painted surface. If some color comes off, chalking has occurred. This type of film breakdown is progressive, and provided it has not gone too far, can be checked by polishing. Here, the important thing is the type of abrasive material to be used. Generally speaking, there are three groups: (1) liquid or paste cleaners, for finishes that show marked chalking; (2) polishes or cleaner-polish combinations, for the finish receiving average care; and (3) polish-wax combinations, similar to the polishes but containing some silicone and/or wax for additional protection. Unless the finish has been neglected for a long time and is very badly chalked and faded, there will be no need for using a cleaner. Cleaners, as a general rule, contain abrasives much too harsh for either lacquer or enamel, and their action is likely to remove more paint than is desirable. Remember that products which do the job fastest and perhaps easiest are not necessarily the best. Polishes likewise contain abrasives but of a kind and amount needed

to remove the average accumulation of chalking without removing paint that is still in good condition; the other ingredients restore the luster and give an appearance approaching that of a new car. Polish alone merely gives a good appearance; it does not protect the finish. Silicone and wax, often found in polishes, repel water and dust to some extent and therefore provide some protection.

The degree of deterioration of automobile finishes by exposure to weather will depend on the length and conditions of exposure. Injury to the finish is brought about by a combination of dew, rain, dust and sand blown by the wind, ultraviolet light, visible light, salt spray in coastal areas, and many other chemically active substances found in the air in industrial communities. A protective film of wax helps to shield a lacquer or enamel finish from the destructive action of the elements. Waxes are available in liquid or paste form and, as mentioned earlier, there are polishes which contain silicone or wax. The latter, however, will not, as a rule, provide as long-lasting protection as will paste products composed chiefly of wax. The wax coating should be applied as often as is necessary to provide positive protection—usually every four to six months—so as to reduce the number of polishing operations necessary to maintain a "polished" look, and so to reduce the amount of paint lost by chalking and subsequent polishing. It should be remembered that wax films are transparent and primarily protect the shine of the surface to which they are applied. If the surface is not properly cleaned first, the wax will seal in the haze and dirt, resulting in a dull and perhaps smeared finish. Exposure tests made over a long period of years, both in the laboratory and on automobiles, have shown conclusively that automobile finishes can be best protected from the elements by use of two separate products — a polish and a wax. Chromium and other metal trim should receive the same care as the paint finish.

CR's tests

To determine the degree of gloss and period of protection offered by the various polishes and waxes, Consumers' Research conducted tests on lacquer- and enamel-coated sheets of the kind used on car bodies. The prepared panels, after treatment with various polishing and waxing products, were subjected to the elements for a period of six months during which time they were periodically examined and measured for gloss. Observations and tests were also made on other significant items including ease of application, durability of coating, tendency to water spot, degree of acidity or alkalinity, and quality of surface produced.

In general, a lacquer finish, while it can be polished to a higher gloss than an enamel finish, will require more maintenance to preserve the high gloss. How often a given finish will need polishing and a protective coating will depend, in large part, on local conditions and the color of the paint; black, deep brown, or deep green have better gloss retention than light blues under the same conditions. The brighter "metallic" colors dull more rapidly, and once badly dulled their initial high gloss cannot be restored by polishing.

The ratings given to the polishes and waxes herein were based on over-all performance. All the polishes and waxes were found satisfactory with respect to absence of undesirable acidity or alkalinity and therefore would not be expected to cause chemical injury to the paint. Whether the product was flammable or combustible or neither did not enter into the rating of the product; however, when such is marked flammable, it should be treated with special care to avoid conditions under which it might be set afire.

For the convenience of the reader, the findings and ratings on polishes and waxes are tabulated separately for lacquer and enamel finishes. Factors that are common in application to lacquered and enameled surfaces are listed in the last two columns of the table.

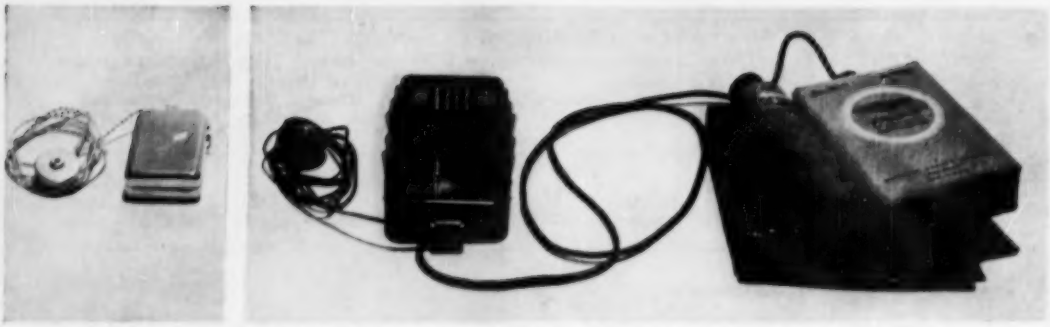
Gloss of each test panel was checked with a laboratory glossmeter every two weeks, as shown above.

Brand, Manufacturer, Price	LACQUER COATINGS *Buick, Cadillac, Chevrolet, Hudson, Lincoln, Oldsmobile, Packard, Pontiac*			ENAMEL COATINGS *Chrysler, DeSoto, Dodge, Ford, Frazer, Henry J, Kaiser, Mercury, Nash, Plymouth, Studebaker, Willys*			Findings Common to Both Lacquer and Enamel Coatings	
	Initial gloss	Durability	CR's rating	Initial gloss	Durability	CR's rating	Resistance to water spotting	Ease of application
Polishes—Containing Abrasives								
Alsol (Alsol Products Co., Newark, N.J.) $2. 8 oz. Paste.	Good	Fair	B	Good	Fair	A	Good	Av.
Autobrite (Boyle-Midway, Inc., Cranford, N.J.) 98c. 12 fl. oz. Liquid.	Good	Fair	B	Good	Fair	A	Good	Av.
Bodysheen (Simoniz Co., Chicago 16) 98c. 16 oz. Liquid.	Good	Good	A	Good	Fair	A	Good	*
Carnu (S. C. Johnson & Son, Inc., Racine, Wis.) 69c. 16 oz. Liquid.	Good	Fair	B	Good	Fair	A	Good	Easy
General Motors (General Motors Corp.) 50c. 16 oz. Liquid.	Good	Poor	B	Good	Fair	B	Good	*, **
Gleem (E. F. Drew & Co., Inc., New York 10) 89c. 8 fl. oz. Liquid.	Good	Fair	B	Poor	Poor	C	Good	Easy
Poli-wax (Western Auto Supply Co.) 65c. 16 oz. Liquid.	Good	Fair	B	Good	Poor	B	Good	Av.
Turtle Wax (Plastone Co., Chicago 22) $1.98. 16 oz. Liquid.	Good	Fair	B	Poor	Poor	C	Good	**
Wards Vitalized (Montgomery Ward's Cat. No. 61—9783) 59c, plus postage. 16 oz. Liquid.	Good	Good	A	Poor	Fair	B	Fair	Easy
Wax Seal (Karseal Corp., Hollywood 38) $1.65. 16 oz. Liquid.	Good	Fair	B	Good	Poor	B	Good	*, **

*Showed a tendency to streak. **Required considerable rubbing. Av.—Average

Brand, Manufacturer, Price	LACQUER COATINGS *Buick, Cadillac, Chevrolet, Hudson, Lincoln, Oldsmobile, Packard, Pontiac*			ENAMEL COATINGS *Chrysler, DeSoto, Dodge, Ford, Frazer, Henry J, Kaiser, Mercury, Nash, Plymouth, Studebaker, Willys*			Findings Common to Both Lacquer and Enamel Coatings	
	Initial gloss	Durability	CR's rating	Initial gloss	Durability	CR's rating	Resistance to water spotting	Ease of application
Protective Coatings (Waxes and Glazes)								
Allstate Glaze (Sears-Roebuck's Cat. No. 28—6901) 55c, plus postage. 10 fl. oz. Liquid.	Good	Good	A	Good	Fair	B	Fair	Av.
Allstate Wax (Sears-Roebuck's Cat. No. 28—6958) 59c, plus postage. 7 oz. Paste.	Good	Fair	B	Good	Fair	B	Good	Av.
Bodygard (Simoniz Co.) 98c. 12 fl. oz. Liquid.	Fair	Poor	C	Fair	Fair	B	Fair	Av.
Car-plate (S. C. Johnson & Son, Inc.) $1.25. 10 oz. Liquid.	Fair	Good	B	Good	Fair	B	Fair	*
DuPont Seven-ite (E. I. DuPont de Nemours & Co., Inc., Wilmington, Del.) 89c. 12 oz. Liquid.	Fair	Fair	B	Fair	Fair	B	Poor	Av.
DuPont Wax (E. I. DuPont de Nemours & Co., Inc.) 89c. 7 oz. Paste.	Good	Fair	B	Fair	Poor	C	Fair	Av.
Mac's-it Super Glaze (Mac's Super Gloss Co., Los Angeles) $1. 4 oz. Paste.	Good	Good	A	Good	Good	A	Fair	Av.
MoPar (Chrysler Corp.) 75c. 16 oz. Liquid.	Good	Good	A	Fair	Fair	B	Good	**
Simonize (Simoniz Co.) 75c. 7 oz. Paste.	Good	Good	A	Good	Fair	B	Fair	**
Wards Vitalized Glaze (Montgomery Ward's Cat. No. 61—9784) 59c, plus postage. 16 oz. Liquid.	Fair	Fair	B	Fair	Fair	B	Fair	Easy
Western Wax Glaze (Western Auto Supply Co.) 69c. 16 oz. Liquid.	Good	Good	A	Good	Fair	B	Fair	Easy

*Showed a tendency to streak. **Required considerable rubbing. Av.—Average



Left—A modern transistorized hearing aid complete with receiver and enclosed battery.

Right—The receiver, hearing aid, and separate A and B batteries of an older model purchased in 1945.

Transistor Hearing Aids

OVER 95 percent of all hearing aids currently manufactured and sold are of the type that use the remarkable new transistor amplifying device. Only a very few years ago all the hearing aids used sub-miniature vacuum tubes, which required both an A battery and a B battery. With the transistor hearing aid, the higher-priced B batteries of 15 to 45 volts output are not required, and a single 1.25-volt or 2.5-volt cell is usually all that is needed to give normal output sound levels. Thus the reduction in battery upkeep cost for the transistor aid is very great as compared to the vacuum-tube type hearing aid. Moreover, the transistor is said to have an average life over 15 times that of the miniature vacuum tube and hence is more economical from the standpoint of the replacements that will be needed occasionally. The average vacuum tube for aids had a life expectancy approximating 5000 hours, while the life of a transistor has been estimated as close to 75,000 hours. As with vacuum tubes, however, rather wide variations in the manufacturing process can be expected, with the result that some transistors may become useless within a short time while others may last well beyond the average life.

The early transistor hearing aids were generally unreliable, and required frequent servicing. With advanced manufacturing techniques which included hermetic sealing, the reliability of the transistors has been improved to a considerable degree. The newer types of transistors have higher power output and lower levels of "background noise" than the earlier ones.

Because of the complexity of manufacture and the need to reject many defective transistors, the cost of the transistor itself is still high by comparison with the vacuum tube. Hearing aids using transistors are generally priced at about $50 more than the vacuum-tube aids sold by the same manufacturer. The price range for the transistor aids begins with the *Acousticon* at $99.50, and extends to the *Radioear Model 830* at $285, and *Telex Model 17* at $299.

Since the average transistor is not much larger than a single kernel of corn, transistor-equipped hearing aids may be made much more compact than aids using vacuum tubes and still give the same power output. Thus, the hearing aids of low power are almost as small and about the same shape as a pocket cigarette lighter, and some weigh less than 3 ounces.

Range of useful response

Most modern transistor hearing aids have an average acoustical (frequency) response of from 400 cycles per second (the G above middle C) to 4000 cycles (the fourth B above middle C). Within this audio range are certain sharp peaks of response which usually occur at two frequency points, one at about 1000 cycles (the second C above middle C) and the other usually at around 3000 cycles (an octave and a half higher, at the fourth G above middle C).

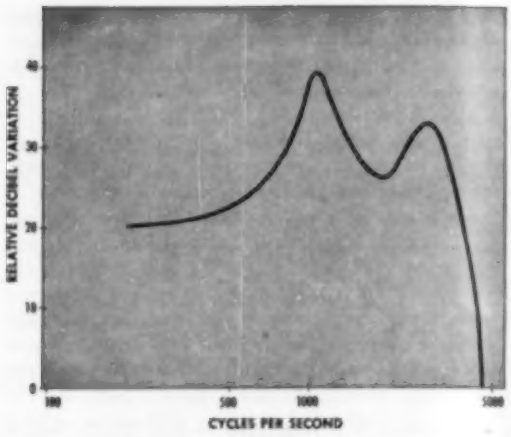


***Figure 1**—General response of a magnetic receiver (alone—not the over-all response of hearing aid and receiver). The microphone used with the aid would cut off frequencies below about 400 cycles, as shown in Figure 2.*

When an attempt is made to lower such peaks to obtain a reasonably flat response to sounds over a wide frequency range, the volume of output suffers and the maximum power obtainable from the aid is reduced.

The frequency response is limited to a considerable degree by the magnetic-type "receiver" regularly used, which resembles an old-style radio headphone in basic construction. Such a receiver usually gives a more reliable performance than some of the crystal receivers employed in vacuum-tube aids; besides, it is more rugged and less affected by moisture and temperature changes.

An average response curve for a receiver giving maximum output is shown in Figure 1. Note that the range is limited and covers only a segment of the musical range needed for really good reproduction of musical sounds, which extends from about 50 cycles per second to frequencies somewhat above 10,000 cycles. Pleasing and fairly realistic reproduction can be obtained, however, with a frequency range of from 100 to 8000 (about one octave more than the range afforded by the average small table-model radio).

It is evident that a hearing aid can restore to only a partial degree the hearing loss suffered by an individual *unless* such loss is confined to the part of the frequency spectrum covered by the hearing aid. When the user hears only the range of frequency response provided by the hearing aid, he will normally have good reception for speech but only partial reception of full-range music, since the lowest bass notes and the highest treble tones of the musical range will not be heard at all. Hearing aids could be refined to give a full frequency response for the hearing of good music, but to do this would call for instruments of considerably greater bulk and weight.

Distortion, noise, and controls

The harmonic distortion (unwanted sound generated within the unit) inherent in the use of transistors cannot be well corrected in any *small* aid. This was true, too, of the vacuum-tube aids, which often gave an average of 8 percent distortion at moderate sound volumes. Transistors have approximately the same degree of distortion at moderate output levels but do not handle overloads as well as the pentode vacuum tubes employed in the older hearing aids. This is exemplified by the fact that with vacuum-tube hearing aids, distortion at maximum volume levels sometimes reached 15 percent; with some transistor hearing aids tested by Consumers' Research the distortion ran to about 20 percent at the upper limit of output.

While the background hiss (also known as background noise) inherent in use of the transistor has been reduced materially in the last few years, in many aids it is still somewhat higher than the noise given by vacuum tubes. In all the hearing aids tested, the noise generated by the transistors during the amplifying process resulted

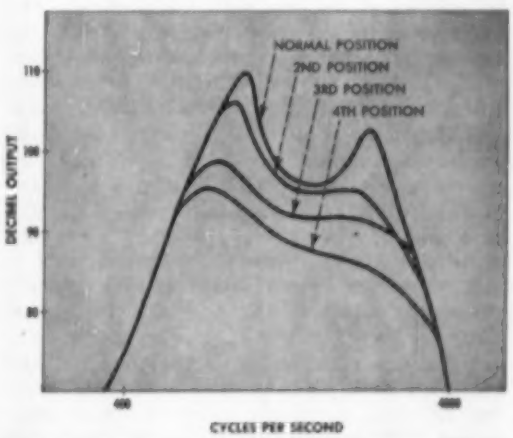
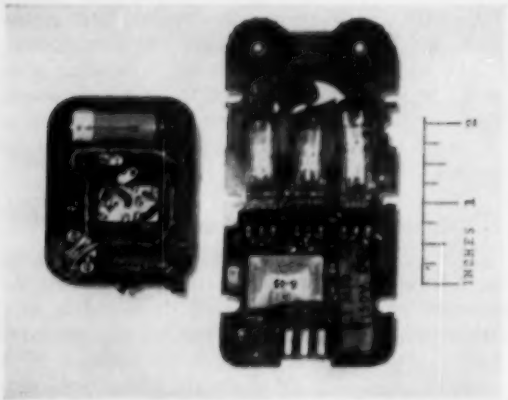


***Figure 2**—Effects of tone control on over-all response of a hearing aid (curves include composite response resulting from microphone, amplifier, and receiver).*



Internally, "miniaturization" of aids results in almost watch-like construction and compactness. An older aid using vacuum tubes is shown at the right for comparison. The older aid weighs about 7 times as much as the modern one.

in a background rustle or hiss, particularly noticeable when the tone-control positions were chosen to reproduce the full range of audio tones available from the aid. When the tone-control position was set to diminish the higher frequencies, the background noise was reduced in proportion to that decrease. Thus, if the hearing loss was such that good amplification of the high tones was necessary for a high degree of intelligibility in the hearing of speech, a higher background noise would have to be tolerated.

One of the annoying problems in wearing a hearing aid has always been noise produced by contact of the case with the clothing. The microphone is normally mounted within the hearing aid housing or case and thus any contact of clothing tends to be transmitted as sound to the microphone, with a considerable degree of amplification. Some manufacturers have made efforts to minimize the clothing rub noise by mounting the microphone in a sponge-rubber cushion within the case and also by using a case having a very high polish. Even with such precautions, however, clothing rub is still a rather serious problem and virtually present at all times except when the user is sitting perfectly still. Most users of aids eventually become accustomed to the crackling and rustling sounds which go with use of their hearing aids and eventually learn to ignore these noises while listening to the sounds they wish to hear.

All hearing aid cases can be improved with respect to clothing rub noise by the application of a paste wax, such as *Simoniz* or *Johnson's Paste Wax*. The hearing aid user can also minimize clothing rub noises by fastening the aid, when possible, to relatively soft fabrics.

The measurement of audio power output at various frequencies is not alone sufficient to permit comparative evaluation of the performance of aids. If the response curve of a hearing aid has an abnormal response or peak at a particular frequency, the power output would be higher than that of a hearing aid having a flat response, yet the aid with the peak would not prove as satisfactory. Unless a major part of the hearing aid loss happens to be at the frequency at which the peak occurs, the abnormal peak would give the illusion of excessive loudness, and since only a narrow range of frequencies is involved, it would not add to the clarity of speech or music. At the same time, the abnormal peak would increase the likelihood of acoustical feedback (whistling or squealing sound) between the microphone and the receiver. To combat this, the user would tend to turn the volume down; the result would very often be that the loudness of sounds heard in the earpiece would not be sufficient for satisfactory hearing.

The feedback problem has always been an aggravation to the user. If sound is permitted to escape from the receiver, such sound will be picked up by the microphone of the aid and will be reamplified. This process builds up until the receiver squeals, and then normal listening becomes impossible. If the sound leakage from the receiver can be reduced, the hearing aid can safely be turned up to a higher volume level when greater loudness is needed. The leakage is at a minimum when the cord fits tightly into the base of the receiver, and the latter in turn fits snugly into the plastic earpiece which feeds the sound into the ear. The earpiece itself must fit the ear well. Thus a fitted earpiece is better than a stock earpiece which may seem to fit fairly closely but is not as snug a fit as is desirable. The fitted (molded) earpiece, which is manufactured from an impression made of the individual ear, fits snugly, and so serves to prevent acoustical feedback and to lessen the possibility of irritation. (A loose or improperly fitted earpiece may, after a few days, irritate the cavity and outer lobe of the ear.)

Virtually all hearing aids have a tone-control adjustment in addition to the usual "on and off" and volume control. In most instances the tone control diminishes the higher frequency response in two or three steps and it can be helpful in minimizing particular sounds

which are at times annoying, such as the rustling of paper, or high-pitched street noises.

The tone control can also be employed to compensate for the peculiar deficiencies of a person's hearing loss. On some aids the tone control is a conveniently placed knurled rotating knob at the top of the hearing aid. Other manufacturers conceal the tone control within the housing so that it is not readily accessible to the user. With this latter design, the tone-control adjustment is made at the time the hearing aid is fitted to the customer.

Fitting an aid

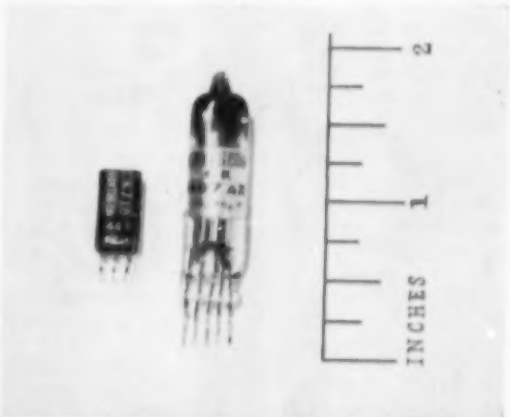
The fitting of a hearing aid to the characteristics of a particular person's hearing loss (CR BULLETIN, February 1955, pages 14-15) has always been a matter of disagreement among manufacturers and authorities on the subject. (Some feel that elaborate fitting processes may not accomplish much more in the case of adults than the results which are obtained by a *discriminating* purchaser who tries on several aids of different makes and then buys the one which gives him the most satisfaction.) Since the response range of all the hearing aids is rather limited, fitting procedures essentially consist of determining which aid has an output adequate for the hearing loss and then regulating the response of the hearing aid to favor the frequency range where the loss is greatest. In order to provide a good range of adjustments, most manufacturers offer three or four different types of receivers, and some also have little plastic tubular inserts which are placed into the opening of the receiver for modifying the response or tone. Differences in response characteristics are thus possible for any given aid. A typical example is shown in Figure 2. Note that whenever the abnormal peaks are reduced the sound level is also cut.

There is no question that in some instances a choice of response characteristics can prove advantageous to help compensate for uneven loss characteristics in the user's hearing. On the other hand, however, many hearing aid users are able to select a satisfactory instrument by simply listening to a number of different makes and models, and choosing one which gives them the clearest reception. The tendency among otologists is to place the hearing aid in the ear which is the poorest, if the loss in both ears is slight. If both ears have a considerable loss, it is preferable to place the aid in the ear which has the better response.

When a variety of receivers is available with a hearing aid, each receiver should be tried, to choose one with the best response. The listening test should be made by listening to speech both at close range and at about 10 feet distance. Musical reproduction from a reasonably good phonograph or radio should also be heard, as a test of tonal clarity. Tone-control positions should also be varied to evaluate their range and effect. Such procedures are well worth while, even though they may entail considerable time on both the part of the prospective buyer and the dealer. With any device so expensive to buy and maintain as a hearing aid, the buyer should assure himself of a suitable instrument before committing himself to pay the price. Several types of air-conduction receivers as well as a bone-conduction receiver are available with all makes.

It is best to purchase a hearing aid from an established dealer who has repair facilities, with a good stock of parts and who has a reputation of giving quick service to the user when needed. Such dealers often have an audiometer so that the degree of hearing loss can be ascertained, and examining offices where impressions can be made of the ear for obtaining the custom-molded earpieces.

Hearing loss may be expected to become greater over the years. Thus the initial hearing aid may become inadequate in terms of volume of sound. In such a case, the user may blame the hearing aid when actually his increasing hearing loss simply calls for a more powerful instrument. An audiometer check



In the modern transistor hearing aid, the transistor shown at the left takes the place of the vacuum tube seen at the right. Both the tube and the transistor are so constructed as to be plugged into sockets in the aid.

will ascertain this. In lieu of the check, a variety of other aids can be tried to ascertain whether they produce improvement in hearing.

When the hearing aid user is in the market for a new aid, he will find it advisable to try several to find the one that gives the clearest reproduction and has a power output suited to his particular hearing loss. He will be wise, also, to check on the degree of clothing rub noise.

Accessories available with most hearing aids are bone-conduction receivers, a variety of air-conduction receivers, and receiver cords of various lengths to suit the individual. The bone-conduction receivers do not give the same clarity of sound as do the air-conduction types, since the bone-conduction instruments must transmit the sound as vibrations through the mastoid bone. The bone-conduction receiver is employed only when the air-conduction receivers cannot be used because of running ears, infection, or other such conditions.

Some hearing aids have provisions for picking up telephone conversations without using the hearing aid microphone. The telephone pickup device consists of a coil enclosed in the housing of the hearing aid which is switched in by a small lever switch. Greater clarity of phone reception results when this method is employed. The disadvantage of the pickup device is that the user is unable to hear sounds in the room while he is using the telephone. While this eliminates distracting sounds during telephone conversations, it also shuts the user off from any sounds which may need to receive his attention.

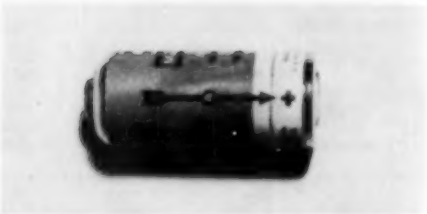
A modern 1½-volt mercury cell as used in transistor aids, compared to a 1½-volt cell for one of the older vacuum-tube aids (length of the scale in the picture is 2 inches).

Results of tests by Consumers' Research

CR has tested a representative group of transistor hearing aids. Except for the saving in battery cost indicated, which is, of course, of the utmost importance to many users, and the far greater compactness of the new aids, no decided advantages were found with the transistor types with respect to frequency range, distortion, and noise factor, as compared to the vacuum-tube aids of former years. The hearing aids tested are listed in the table on page 16. The average current consumption indicated is also a clue regarding the battery life which can be expected under normal usage. Battery life, however, is subject to considerable variation; it depends on the amount of time the hearing aid is used each day and also the type of battery employed. The ordinary 1½-volt battery has a gradual voltage decline as the battery is used so that the sound heard becomes gradually weaker. The mercury cells, however, provide a substantially constant voltage output (1.25 volts) over an extended period and then fail abruptly. Mercury cells usually last longer in the hearing aid than equivalent dry cells of the older type. Batteries for a transistor aid may cost about $2 a year, as compared with almost $50 for a vacuum-tube aid.

Some hearing aids include means for using higher-voltage batteries to provide greater power output (volume of sound), as indicated in the table. An accessory in the form of a cord which plugs into the battery compartment can be used with some aids; this permits a large external battery to be employed, for greater economy. Some such batteries have a life of 500 to 1000 or more hours.

The type of spring clip employed for fastening the hearing aid to the clothing should be examined, for some clips are difficult to open and are apt to tear thin or weak fabrics. The battery compartment should be inspected to ascertain the type of battery-holding springs employed. Some employ steel springs, which are apt to corrode and thus may give noisy reception after a time. Battery polarity markings (+, −) within the case are important because, if they are not clearly indicated, the user may install the battery incorrectly. Even though in some hearing aids this may not damage the transistors, it will result in poor reception or none at all, and unless the user suspects that the battery has been put in wrong, he may make a



The positive (or negative) battery terminal should be clearly identified. The picture above of a mercury cell illustrates good positive (+) polarity marking.

needless trip to a service dealer before he can use the hearing aid again.

Today's typical transistor hearing aid employs three transistors. Most companies use simple resistor-capacitor amplifying circuits, but the lower-priced *Zenith* uses miniature transformers to gain greater sound output. Overloading of such transformers on peaks occurs more easily than with the resistor-capacitor circuit. If the amount of sound distortion at louder volume levels becomes annoying for the lower-priced models, then higher-priced models should be tried; these have higher peak output and provide less distortion at medium output. The *Telex Model 17* employs five transistors, with a specially designed (push-pull) output circuit. The push-pull circuit gives a high power output with no more distortion than is given by "single-ended" output running at lower volume. Such a five-transistor hearing aid is designed primarily for people who have a very great hearing loss and thus require more than normal volume level.

In the listings, where an aid is recommended for medium hearing loss, it would usually be an unwise choice when the hearing loss is severe. Hearing aids are relatively expensive, and because of the limited market and very low resale value of even a new aid, it was decided, in the interest of economy, that CR would arrange to rent or borrow from the manufacturers the aids to be tested, guaranteeing their return in new condition and agreeing to pay for any servicing that might conceivably be needed, as well as all shipping and handling charges. The aids reported on in this article were obtained on loan or rental.

A. Recommended

Paravox, Model SH (Paravox, Inc.) $175. For slight hearing loss. Power and tonal characteristics can be altered by 3-position tone control adjustable by screw driver from back and by choice of receiver. Clothing rub noise, low; case has good gloss. Transistor noise level, average. Had 2 flat-prong spring-loaded holding clasps at side of front microphone grille; they have good (but not excessive) tension. Battery compartment clearly marked, with good spring contact. Operating efficiency somewhat lower than average. **2**

Paravox, Model S (Paravox, Inc.) $175. For slight hearing loss. Same general characteristics as *Model SH* except for slightly lower power output. **2**

Audivox, Model 71 (Audivox, Inc., 123 Worcester St., Boston 18) $250. Suitable for slight or medium hearing loss. Power and tonal characteristics can be altered by choice of receiver used. Battery compartment clearly marked to show proper placement of cells; had strong flat-type spring contacts. Clothing rub noise, below average because of high-gloss case. Transistor (circuit) noise, average. The two flat-prong holding clasps at each side of front microphone grille were difficult to mount on thick clothing. This aid has built-in telephone pickup coil. **3**

Audivox, Model 71-125T (Audivox, Inc.) $240. Suitable for medium or severe hearing loss. Power and tonal characteristics can be altered by external 2-position tone control and by choice of the receiver used. Battery compartment clearly marked to show proper placement of cells and has strong flat-type contact springs. Clothing rub noise, below average because of high-gloss case. Transistor (circuit) noise, average. Same type case as *Model 71*, same accessories. **3**

Beltone, Model C (Beltone Hearing Aid Co., 2900 W. 36 St., Chicago 32) $279.36. Suitable for slight or medium hearing loss. Power and tonal characteristics can be altered by external 2-position tone control and by choice of receiver used. Clothing rub noise, below average. Transistor noise level, average. Battery compartment clearly marked; has good flat-spring contact. The two holding clasps on the front are flat, narrow, and difficult to mount on thick clothing. Telephone pickup coil optional. **3**

Beltone, Model AL (Beltone Hearing Aid Co.) $279.36. For slight hearing loss. Power and tonal characteristics can be altered by 2-position lever tone control and by choice of receiver used. Battery compartment clearly marked; good flat-type spring contacts. Clothing rub noise, below average because of high-gloss case. Transistor noise level, average. Holding clasp is on front center, and is the narrow flat type. **3**

Otarion, Model D-1 (Otarion, Inc., 185-7 Ashford Ave., Dobbs Ferry, N.Y.) $229.50. For slight hearing loss. Power and tonal characteristics can be altered by 2-position tone control and by choice of receiver used. Battery compartment clearly marked,

(*Continued on page 17*)

Data on 19 Transistor Hearing Aids

Make and model	Size in inches depth × length × width	Battery voltage	Weight with battery,‡ oz.	Average current used, milliamps.	Relative power output*	Tone control**	Built-in telephone pickup
Audivox 71	0.75 x 3.00 x 1.85 (width tapers)	2.5	3.9	4	med.	none	yes
Audivox 71-125T	0.80 x 2.95 x 1.90 (width tapers)	3.75	4.3	5	high	external 2-position	no
Acousticon A-340	0.65 x 2.55 x 1.85	1.5	2.1	3	low	none	no
Beltone C	0.65 x 2.95 x 2.15 (width tapers)	2.5	3.2	4	med.	external 2-position	optional
Beltone AL	0.65 x 2.30 x 1.65	1.25	2.2	1.5	low	external 2-position	no
Otarion D-7	0.55 x 2.05 x 1.35	2.5	2.0	2	low	external 2-position	no
Otarion C-15†	0.90 x 2.55 x 1.80	1.5 and 15 B	4.0	9	low	external 2-position	no
Otarion D-1	0.90 x 2.50 x 1.80	1.25 or 2.6	3.8 4.2	2.5 3	low low	external 2-position	no
Paravox SH	0.90 x 2.95 x 1.80	2.6	3.4	4	low	screw driver adjustment on back	no
Paravox S	same as *Model SH*	2.6	3.5	3.5	low	screw driver adjustment on back	no
Paravox RH	0.65 x 2.45 x 1.75	2.5	2.8	4	low	external 3-position	no
Paravox R	same as *Model RH*	1.5	2.7	2.5	low	external 3-position	no
Radioear 830	0.70 x 2.85 x 1.70 (width tapers)	1.5 2.5	3.2	1.5 4	low med.	internal	yes
Telex 600	0.65 x 3.50 x 1.95	1.5 2.6	3.0 3.2	2.0 3.5	low med.	none	no
Telex 17	same as *Model 600*	3 5	4.3 4.2	2.5 4	high high	screw driver adjustment on back	no
Zenith Royal M	0.70 x 2.65 x 1.85	1.5	2.6	5	low	external 4-position	yes
Zenith Royal T	0.90 x 3.00 x 2.35	1.5	4.7	5	low	external 4-position	yes
Zenith Super Royal T	same as *Royal T*	2.6	4.8	6	med.	external 4-position	yes
Zenith Ultra Royal T	0.95 x 4.45 x 2.35	4.5	7.0	15	high	external 4-position	yes

*Average power output level; low, med. (medium), high; not based on peaks of power output or saturation. Measured with distortion at 5 to 7 percent and in frequency range between 300 and 500 cycles per second.
**Tone can be varied by using a variety of receivers combined with plastic tubular inserts.
†*Otarion Model C-15* uses two sub-miniature vacuum tubes and one transistor.
‡Receiver and cord add about 1/3 oz. to the weights.

with good flat-spring contacts. Clothing rub noise, low because of high-gloss case. Transistor noise level somewhat above average. Adapter available for use of either 1.25- or 2.6-volt battery. Holding clasps consist of narrow spring clips at sides (somewhat difficult to mount on thick clothing). **3**

Otarion, Model D-7 (Otarion, Inc.) $274.50. For slight hearing loss. Power and tonal characteristics can be altered by 2-position tone control and by choice of receiver. Battery compartment clearly marked, with good conical-spring contact. Clothing rub noise, low, because of high-gloss case. Transistor noise level higher than average. Spring wire holding clasp, reversible, but see comment under *Zenith Royal M*. Smallest and lightest of aids tested. **3**

Paravox, Model R (Paravox, Inc., 2056 E. Fourth St., Cleveland 15) $225. For slight hearing loss. Power and tonal characteristics can be altered by 3-position tone control and by choice of receiver used. Battery compartment clearly marked, with flat-spring contacts. Clothing rub noise, below average. Transistor noise level, average. Two narrow flat-type holding clasps on front of case, each side of microphone grille, were difficult to mount on thick clothing. Battery current consumption, lower than most aids. **3**

B. Intermediate

Acousticon, Model A-340 (Dictograph Products, Inc., Jamaica 35, N.Y.) $99.50. For slight hearing loss. Power and tonal characteristics can be altered by 2-position lever on side for loud and soft output adjustment and by choice of receiver. Clothing rub noise, average, with semi-gloss case. Transistor noise level, average. Either a 1.25 mercury cell or a 1.5-volt carbon-zinc battery can be used, with lowest current drain for 1.25-volt battery and only an inconsequential difference in output. Thin spring-steel wire holding clasp. Battery compartment "plus" polarity marking obscured by battery spring, making the plus sign appear as a minus sign, which could lead to incorrect battery insertion. Had good flat-spring battery contacts. No tone control. **1**

Telex, Model 600 (Telex, Inc., Telex Park, St. Paul 1) $129. For slight or medium hearing loss. Power output can be altered by use of either 1.25- or 2.6-volt battery. No tone control was used, but plastic tubular inserts are available as accessories to be placed into receiver aperture for altering response. Battery compartment clearly marked, with good flat-spring contacts. Clothing rub noise, average, with semi-gloss case used. Holding clasp, flat type, front-mounted and easy to use. Transistor noise level, average. **1**

Zenith, Royal M (Zenith Radio Corp., 5801 W. Dickens Ave., Chicago 39) $100. For slight hearing loss. The power and tonal characteristics can be altered by 4-position tone control and by choice of receiver used. Has built-in telephone pickup coil. Clothing rub noise, average; semi-gloss case. Circuit noise level slightly above average on two tone-control positions. Battery compartment clearly marked. Had flat conical-spring battery contact. Holding clasp is reversible, but when moved must be sprung into place and may scratch sides of case. Current drain slightly higher than for some other aids with equivalent power output (see table). **1**

Zenith, Royal T (Zenith Radio Corp.) $125. For slight loss. Power and tonal characteristics can be altered by 4-position tone control and by choice of receiver. Has socket for plugging in external microphone to reduce clothing rub and to reduce masking of sounds by heavy garments during winter wear. Has built-in telephone pickup coil. Clothing rub noise, average; semi-gloss finish on case. Circuit noise level slightly above average on two tone-control positions. Had flat conical-spring battery contact. Instructions for placement of battery on lid opposite battery compartment; CR would prefer to have the markings inside battery compartment. Thin steel spring holding clasp, reversible, sprung into place; satisfactory, but see comment under *Zenith Royal M*. Current drain slightly higher than for some other aids with equivalent power output (see table). **1**

Zenith, Super Royal T (Zenith Radio Corp.) $125. For slight or medium loss. Same size case and general characteristics as *Royal T*, but uses 2.6-volt battery and has more power output. Battery polarity instructions not entirely clear. **1**

Zenith, Ultra Royal T (Zenith Radio Corp.) $125. For slight, medium, or severe loss. Uses three "penlight"-type batteries (total 4.5 volts) to attain needed power output. High power output gained at sacrifice of small size, and at greater battery replacement cost, plus weight. Power output and tonal characteristics can be altered by use of 4-position tone-control switch and by choice of receiver. Has built-in telephone pickup coil. Clothing rub noise higher than average, because of high gain. Circuit noise, above average on two tone-control positions. Instructions for placement of battery on lid opposite battery compartment. Good flat-spring battery contacts. Thin steel spring holding clasp, reversible, sprung into place, but see comment under *Zenith Royal M*. Current drain, highest of the aids tested. **1**

Otarion, Model C-15 (Otarion, Inc.) $139.50. For slight loss. Uses two sub-miniature tubes and only one transistor. Thus a 15-volt B battery is necessary in addition to a 1.25-volt A battery. Current consumption, high for power delivered; otherwise a first-rate aid. Has 2-position tone-control switch. Distortion is only 5% and low compared to other aids tested. Clothing rub noise, below average because of high-gloss case. Battery compartment clearly marked; good flat-spring contacts. Holding clips are narrow spring types, sometimes difficult to fasten to clothing. **2**

Paravox, Model RH (Paravox, Inc.) $225. For slight hearing loss. Smaller case than *Models S* and *SH*, with same general characteristics in output,

current drain, and quality as *Model SH*. Has external 3-position tone-control switch. Transistor noise level slightly higher than average on "high" setting of tone control. Battery compartment clearly marked, with flat-spring contacts. **3**

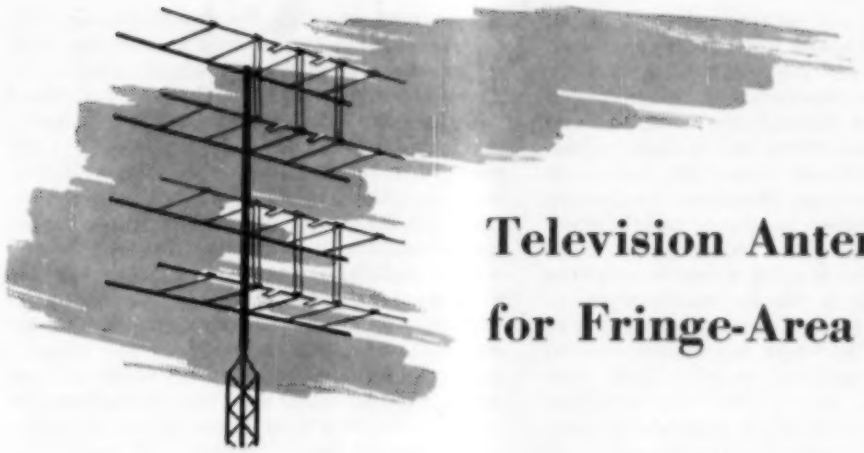
Radioear, Model 830 (Radioear Corp., 306 Beverly Rd., Pittsburgh 16) $285. For slight to medium hearing loss. Has screw adjustment in battery compartment for adjusting output level. Low and high frequency adjustments to microphone are possible, through use of a setscrew adjustment and "tone plates." Three types of receivers are also available, to alter response. Has built-in telephone pickup coil. Has provisions for external large size 1½-volt No. 728 battery to extend battery life and reduce battery cost (with the inconvenience of wearing a battery pack in addition to the hearing aid). External battery case is also available to accommodate 3 cells (4.5 volts) to raise output for use by persons with severe hearing loss. Battery compartment clearly marked and has good flat-spring contact. Clothing rub noise higher than average (dull-gloss case, and microphone mount not cushioned sufficiently). Holding clasp, flat-front type, in front of microphone grille. Transistor noise level was slightly higher than average when receiver and aid were adjusted for best frequency range. Cost is high compared to aids with equivalent power output. **3**

Telex, Model 17 (Telex, Inc.) $299, with custom ear mold. For slight, medium, or severe hearing loss. Uses 5 transistors in Class B push-pull circuit instead of 3 transistors as found in most aids. Has high power output with low current consumption. Power output can be varied by using either two 1.25-volt batteries for a total of 2.5 volts, or two 2.5-volt batteries in series for a total of 5 volts. Output level can also be varied (as well as tonal characteristics) by adjustment of tone control on back by screw driver and by choice of receiver. Has built-in telephone pickup coil. Battery compartment clearly marked and had flat-spring contacts. Transistor noise level, average. Clothing rub slightly above average because of semi-gloss case and type of cushioning used for microphone. Holding clasp, flat type, front-mounted, easy to use. This *Telex* is higher in price than the other aids tested that were designed for severe hearing loss. **3**

Abridged Cumulative Index of Previous 1955 Consumers' Research Bulletins

	Month	Page
Air conditioners, 1954 models, price cuts	Apr.,	38
Air conditioning, central residential†	Mar.,	29-32; Apr., 31-34
Allergy, monosodium glutamate	Mar.,	4
Apple parer, corer, and slicer†	Mar.,	12
Appliance testing	Jan.,	2, 24-26
Athlete's foot, prevention	Apr.,	3
Automobiles, 1955†		
MG "TF" 1500, Pontiac Star Chief V-8 Hydra-Matic	Jan.,	21-24
Buick Special Dynaflow, Chevrolet V-8 Bel Air Powerglide, Chevrolet 210 Six with overdrive, Ford V-8 Customline, Ford V-8 Fairlane Ford-omatic, Plymouth Belvedere V-8 PowerFlite, Studebaker Champion DeLuxe	Feb.,	5-12, 23
Buick Roadmaster, Chevrolet 210 V-8, Dodge Custom Royal V-8 PowerFlite, Ford Mainline 6, Mercury Monterey Merc-O-Matic, Oldsmobile Super 88 Hydra-Matic, Plymouth Savoy V-8 and 6	Mar.,	5-12
Cadillac 62, DeSoto Firedite V-8 PowerFlite, Packard Clipper Custom Ultra-matic, Plymouth Belvedere V-8 PowerFlite 167 hp.; with 2-page data table on 48 cars, and discussion of tubeless tires, power steering, etc.	Apr.,	5-22
Automobiles, driving costs, review of book	Apr.,	3
Batteries, mercury-type hearing aid, disposal hazard	Feb.,	3-4
Blankets, electric, repair service	Feb.,	4, 33
Boric acid, poisoning hazard	Jan.,	4, 33
Breakfast, adequate, important	Apr.,	4
Corrections and emendations†	Jan.,	28; Mar., 28; Apr., 30
Detergents, synthetic†	Mar.,	27-28
Diapers, baby's†	Mar.,	18-21
pins†	Mar.,	22
Dishwashers, automatic†	Mar.,	13-16
Drills, electric, speed reducer†	Mar.,	36-37
Editorial	each issue,	page 2
Electricity, static†	Feb.,	27-28
Electronic circuits, printed	Mar.,	37-38
Gardening, home, supplies, etc., advertising claims	Apr.,	4, 37
Garments, color loss, causes	Apr.,	4
women's, size standards	Apr.,	37-38
Gloves, household†	Feb.,	16-18
Hangers, shelf†	Jan.,	34
Hearing loss and hearing aids	Feb.,	13-15
Insulating coating for tool handles†	Apr.,	23
Irons, steam†	Apr.,	24-30
Kitchen equipment, built-in, installation problems	Mar.,	3; Apr., 37
Leather goods, labeling	Apr.,	3
Motion pictures†	each issue	
Opener for pry-off lids†	Mar.,	42
Oranges, coal-tar dye banned	Apr.,	4
Paintbrush cleaner†	Jan.,	34
Paints, matching difficulties†	Mar.,	4
lead, hazardous to children	Mar.,	41
Penicillin shots for colds, ineffective	Jan.,	4
Photography, stereoscopic†	Mar.,	33-35
Photostats, low-priced source†	Mar.,	38
Pistols, air†	Jan.,	27-28
Potato baking rack†	Feb.,	34
Radio receivers, "all-wave"†	Jan.,	29-30
Records, phonograph†	each issue	
stylus wear testing device†	Mar.,	17
Rugs, tufted cotton, cleanability	Apr.,	37
Rust remover, liquid†	Feb.,	28-29
Saws, electric, portable†	Jan.,	5-10
Scouring pads, abrasive-surfaced sponge rubber†	Apr.,	38
Septic tanks, operation	Mar.,	3-4
Shirts, men's white dress†	Jan.,	11-15
Siding, redwood, cedar, finishing†	Feb.,	21-23
Suits, men's washable, special handling	Apr.,	3
Sweater, poor washability†	Feb.,	19-20
Sweeteners, artificial, indiscriminate use	Apr.,	3
Table, "wrought iron," TV	Jan.,	26
Telephone handsets and telephone accessories†	Feb.,	24-26
Television receivers†	Mar.,	23-26
Tire gauges†	Feb.,	29-30
Toast, French, device for†	Mar.,	42
Vacuum cleaners†	Jan.,	16-20
Vitamins, excessive intake harmful	Feb.,	3
Water, "conditioning" gadgets	Mar.,	26
fluoridation	Feb.,	26; Apr., 4

†indicates that listings of names or brands are included.



Television Antennas for Fringe-Area Service

ONE of the most important links in the chain of good television reception is the antenna. Whether your antenna is built into the set, or is an indoor antenna placed on top of the set, or a regular outdoor antenna on the roof, or a free-standing one on a tower, it is important that it be of proper design to give the best reception that can be had in your location.

There are many different types of antennas in use today. One which was not in evidence until about 1949 is common now; this antenna is built into the set itself, usually as a strip of lead-in wire formed into the correct shape and tacked on the inside of the cabinet. In some cases such an antenna may be "tunable" and of complex design and construction.

Another kind of antenna is that designed specially for use indoors; one variation of this is more familiarly known as the "rabbit's ears" kind, which sits on top of the set. Indoor and built-in antennas were not covered in this test, as they are not generally useful in fringe areas. A third and very widely used antenna is the outdoor kind, which is now seen on millions of American rooftops.

The built-in antenna is effective where TV signals are strong, usually in metropolitan areas where the power of the station is high enough and the lay of the land such as to make it easy to obtain good reception. A separate indoor antenna usually delivers a somewhat stronger signal to the receiver than the built-in antenna; indoor antennas are used in cities and near-by suburban areas. Outdoor antennas are much in evidence in all areas of television reception, and in fringe areas use of a good outdoor antenna is a necessity to give as good television reception as can be had in a given area.

In recent years the television stations have increased their transmitting power and raised the height of their antennas to such a degree that the areas which were formerly looked upon as fringe areas now afford excellent reception; thus the fringe area has been pushed out farther and farther. As more and more telecasting stations are established in hitherto unserved areas, fringe areas will eventually disappear for all but a minor percentage of the population. For the present, however, a considerable proportion of viewers are receiving television signals in locations at extreme distances (100 miles or more) from the television transmitter.

Factors in long-distance reception

The signals sent out by television transmitting antennas are of very high frequencies (short wave length) as compared to ordinary broadcast radio signals, which cover 540 to 1600 kilocycles per second (long wave length). They cover a band of frequencies ranging from 54 megacycles per second to 216 megacycles per second, for the VHF band. UHF transmission is on even higher frequencies, ranging from 470 megacycles to 940 megacycles. (One megacycle per second is 1,000,000 cycles per second; one kilocycle per second is 1000 cycles per second.)

The lower frequencies of radio transmission (AM type) are not so limited to distance covered as are the TV and FM frequencies. These longer waves are reflected downward from a layer of the atmosphere known as the ionosphere back to the earth and then are reflected upward to continue in a forward direction. This bouncing back and forth continues until the waves become too weak to be useful. If they are strong enough initially, they may even go completely

around the world and be received again at the point of origin. TV and FM signals are at such high frequencies that they do not bounce back and forth between the earth and the ionosphere. They continue on through the ionosphere and are thus to a large extent lost in empty space.

Theoretically, signals above 30 megacycles in the daytime and over 20 megacycles at night are limited in distance to what is called line-of-sight transmission. Thus, at best, they might be expected to reach a point on the spherical surface of the earth, that is usually about 50 to 55 miles from the television station (see Figure 1), provided their path is not obstructed by mountains, tall buildings, or other high intervening obstacles. If the theoretical condition held true at all times, there would be no television reception greater than this distance of 50 to 55 miles, and all television would be limited to line-of-sight distances. Fortunately, however, depending on atmospheric conditions, such as temperature, moisture content of the air, and the atmospheric pressure at the time, the VHF television waves will be bent slightly (refracted), and allow reception to be had at a distance considerably past the 55-mile limit (see Figure 1). As the frequency increases toward the UHF band, this bending effect diminishes. Transmitting stations have increased the power radiated and their antenna heights; these factors help considerably. The signal strength falls off rapidly with increasing distance, so that by the time the signal gets to a receiver 60 to 70 miles or more from the transmitter a great deal of the original power has been lost.

A great deal of noise always enters the set, and when a signal of very low strength reaches the receiver, this noise shows up on the screen in the form of "snow," which is all too familiar to the millions of people who are now viewing TV pictures in fringe areas. The only way that this "snow" can be reduced, in a set which

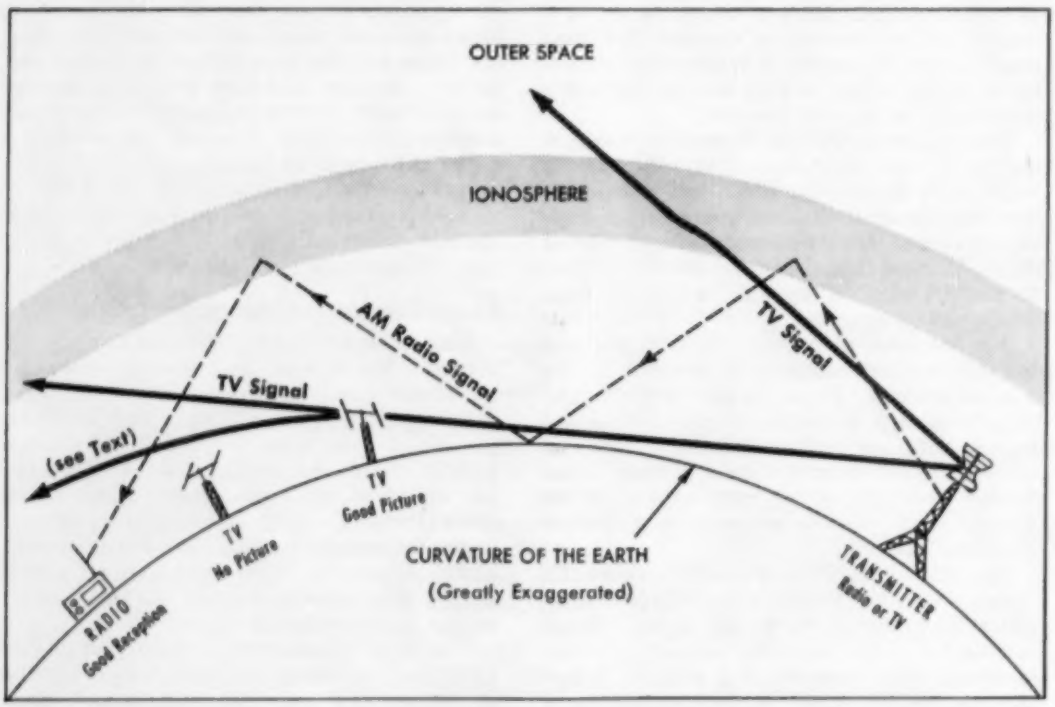


Figure 1

← – – – – – – – – *Radio signal "bounces" from ionosphere.*

◄——————— *TV signal continues in straight line.*

Diagram shows radio wave "bouncing" along curved surface of the earth to a distant receiver. The TV (or FM) signal is propagated through the air in a straight line, arriving at an antenna located at or above the line-of-sight path (or through the ionosphere to outer space).

has been properly tuned, is to increase the amount of signal power entering the set. The best way to accomplish this is to have a "high-gain" antenna, so that the signal power will be at as high a level as possible when it enters the circuits of the set.

The use of boosters is often helpful in getting a usable picture, but even a booster must have a proper signal to work with, or will mostly boost visual "noise" or "snow." In order to get the maximum signal at the high TV frequencies, an antenna should be very directional. The directional antenna will operate something like a funnel and pick up a signal from one direction only so that the desired signal is separated from other signals and from noise, and delivered to the booster or set.

Area considerations

In the cities which have TV transmitters, the problem of low signal strength is less troublesome than that of "ghosts" or reflected signals. The strong signal usually present will bounce off buildings, water towers, steel bridges, cliffs, and other solid objects, so that along with the direct signal from the station the receiver will be getting a slightly delayed reflected signal. This time lag gives a slightly displaced image on the screen along with the original image. This is known as a "ghost" condition. The best way to eliminate this when it is troublesome is to use a highly directional antenna, which will strongly favor the signals that come from the direction in which it is pointed. Pointing such a highly directional antenna toward the TV transmitter helps to reject reflected signals that come from other directions and thus greatly reduces the problem of "ghost images."

Long distance reception can best be had by putting a receiving antenna at the greatest practicable height (see Figure 1). The higher the antenna in a very weak signal area the better the results will be, within certain limits. Of course, the high antenna should be "pointed" directly at the station so as to pick up the maximum signal strength practicable in the location.

Ideally, an antenna should be cut to about one half the wave length of the television station. This is hardly practical where a number of channels are to be received, for one would need a separate antenna and lead-in for each channel. This method, however, is actually followed by those who can afford it, in some extreme fringe areas.

A good type of antenna for *single-channel* reception is the Yagi, which CR has tested (see listings). The multiple-antenna system makes for a quite complicated and expensive installation, but it works out very well for areas where only one or perhaps two stations are received. In order to get around the complications and expense of a multiple-antenna installation, the wide-band antenna has been developed; this kind of antenna will cover fairly well all of the channels in the VHF band and some of the types will even cover passably well the combined UHF and VHF bands. Since this is necessarily a compromise development, one should not expect to equal, with it, the superior performance that might be given by use of the right *single-channel* antenna.

One problem with wide-band antennas is that they do not deliver equal signal input on all channels. One antenna may have exceptionally good gain on the low VHF channels (2-6) but fall off on the high channels (7-13) or vice versa. In choosing a high-gain outdoor antenna, you should first determine what stations are available and choose your antenna on the basis of performance on channels you wish to receive best. If TV signals arrive from different directions, it will often be in order to install a rotator on the antenna to allow the antenna to be turned to the direction of each station as desired.

Installation

The design of the antenna is a very important part of good reception in outlying districts, but proper installation is vital, too. Since in most cases antennas for fringe-area use will be installed at considerable heights and will involve substantial expenditures, the installation should be a very secure one and the antenna should be chosen for good mechanical strength as well as good electrical performance, to keep down costs of repairs and servicing. This is very important in areas where ice may build up during the winter season and where high winds may be encountered, perhaps at the very time the antenna is carrying a heavy load of ice. Good strength and ability to withstand wind are necessities on very high installations. In some areas at great distances from a station, or where hills or mountains intervene, the masts may be as high as 100 feet or more. Such installations are costly, and involve a good deal of expense in repair and replacement. Lead-in wires should be fastened securely to the mast or tower with standoff insulators and kept away from metal roofs and power lines. *It cannot be urged too strongly that an antenna installation be erected in a location where neither it nor the supporting guy wires can, under any circumstances, fall over on or come into contact with a power line if it or the line*

should be blown down during a severe windstorm.

As with any outside antenna, the mast or tower system should be well grounded, and an approved lightning arrester should be installed both in the motor lead (if a rotator is used) and in the antenna transmission line. A good workmanlike installation of television antenna and tower will pay dividends in good reception over a long period of time.

UHF antennas are not included in this present test, but they are similar to the VHF antennas except that they are much smaller in size. The fringe area for UHF reception is smaller because of higher transmission losses present with such high frequencies. Since these frequencies are very much higher than the VHF television frequencies, there is usually no bending of the signal as was described previously, and reception is limited to a direct line-of-sight transmission.

While the antennas covered in CR's tests were limited to seven specific brand names, there are many other antennas very similar in appearance and design, manufactured by other companies. While most of these antennas will be similar electrically and may be expected to give equivalent performance, they may vary widely in their mechanical construction.

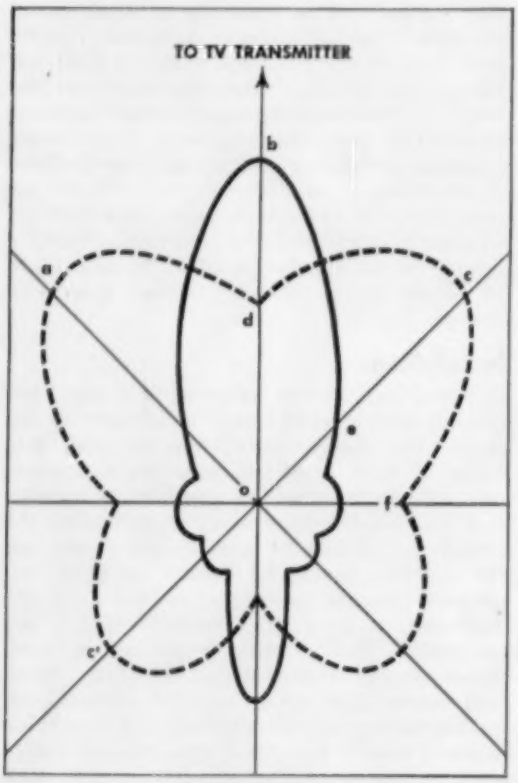


Figure 2

The diagram shows the way the reception varies with respect to the direction in which the antenna is pointed in relation to the transmitting station.

Maximum points a, b, c show reception when the antennas of two types are correctly pointed. Turning the antenna through 45 degrees would give points d, e, f, in which it is seen that the received signal is much weaker. The received signal is measured from the origin at 0 along a radius to the points mentioned.

Front-to-back ratio for the antenna represented by the dotted line is indicated by ratio of oc divided by oc'. Above curves show polar response for channel 12 of two antennas included in CR's test. Each antenna was measured on three other channels as well.

Color television performance

While color television transmission is quite similar to transmission of signals for black-and-white pictures, a great deal more "information" (signal content) is sent out from the transmitting station when the signals must carry color as well as form and gradation. Along with picture and sound and synchronizing "information" is the information that is necessary to determine image coloration. Most ordinary antennas as used today have a wide enough frequency response to bring color reception satisfactorily. However, it is necessary that all antennas have a wide enough frequency response to pick up with sufficient strength all of the information that is being sent out. Very-narrow-band antennas will not perform well with color. Whereas in black-and-white reception a bit of information lost from the signal is not critical, the result can be most unpleasant on the screen, when color is involved. It is believed that all the antennas tested should serve equally well for color and black-and-white transmissions.

CR's test of TV antennas

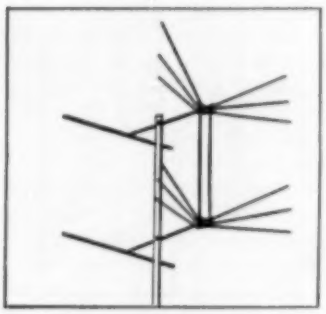
Seven types of high-gain outdoor TV antennas were tested for their electrical performance and examined for construction and strength and ease of assembly. All of these but the Yagi and *Gonset* were stacked arrays, that is one antenna section mounted above another. One section is often used as a single unit in good signal areas. There are many more types of antennas available, but many are either of the type used in primary or high signal areas, or are of much the same design as those chosen for test. The antennas reported on are popular types used mostly in fringe areas (since the antenna is normally no great problem at places near the transmitting station). Consideration

was given to mechanical construction, and resistance to wind and vibration, as in many locations outdoor antennas will be mounted on high masts or towers (20 to 100 feet or more) and will thereby be exposed to extreme weather and high wind velocities.

Since many areas receive telecasts from a number of stations in the low and high VHF TV bands, attention was given to gain characteristics over the entire VHF band. Some antennas performed well on the low frequency channels but were poor on the high ones.

The ability to pick up and deliver the TV signal (gain) was measured on low channels and on high channels. A polar graph which shows how much signal is picked up on all sides of the antenna was plotted for all the antennas. (This is also a measure of how well the antenna will reject signals from directions other than the one in which the antenna is pointed.) The prices shown are the advertised list prices of each manufacturer, but most of the antennas can be bought at lower or "net" prices (about 40 percent off list) from mail-order or discount-houses, or radio or television parts distributors.

A. Recommended

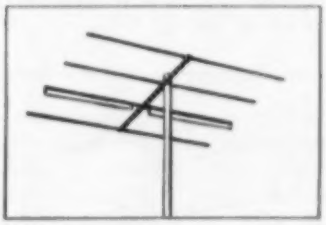


JFD "Jetenna" 161 (JFD Mfg. Co., Inc., 6101 16 Ave., Brooklyn, N.Y.) $24.75.

A well-made conical antenna with good low and high channel performance and judged to have good mechanical strength.

Description: A stacked conical antenna judged to be of excellent mechanical construction. Pre-assembled, so that the antenna required only to be unfolded and wing nuts tightened. Ability to withstand wind and vibration judged very good; ease of assembly, very satisfactory.

Performance: Gain on both low and high channels, good. Front-to-back ratio (ability to reject signals coming from the direction opposite the desired station), fair on low channels, good on high channels. Directivity, good on all channels. This antenna should give good performance in most locations. **2**



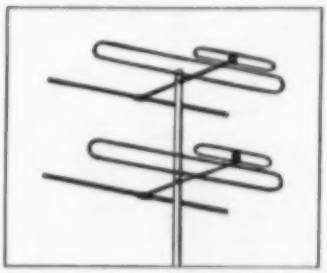
Universal Pretuned Yagi (Universal Radio & Television Co., 2350 E. Main St., Stockton, Calif.) $13.95.

Judged to be a well-made single-channel antenna which offers a big advantage in areas where one channel is all that is available, and where there are problems of "ghosts" or noise.

Description: A well-made 4-element Yagi antenna. Mechanical strength judged very good. Ability to withstand wind and vibration judged very good. Antenna of pre-assembled design making for ease of installation.

Performance: Antenna tested was cut for channel 7 and had good gain in the forward direction. Front-to-back ratio, good (see listing of *JFD "Jetenna"*). As this antenna had very good directivity, it is recommended for areas where reflected signals (or "ghosts") are prevalent. It is available in models cut to any desired channel, from 2 to 13. **2**

B. Intermediate



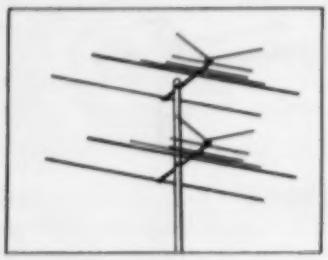
Amphenol 2 bay inline, Model 114-314 (American Phenolic Corp., Chicago) $29.

An antenna of medium electrical performance but judged to be of exceptionally good mechanical construction.

Description: Actually two antennas in one. Separate dipoles were provided for low and high channels and connected with 300-ohm transmission line of proper electrical length. Mechanical strength judged very good. Slightly more complicated to assemble than

"pre-assembled" types exemplified by *JFD* and *Vee-D-X*.

Performance: Gain, fair on both low and high channels. Front-to-back ratio varied from poor to fair depending on channel tuned in. Directivity, poor on low channels (2-6), good on high channels (7-13). ¶Same as *114-302* and *114-322*. **2**

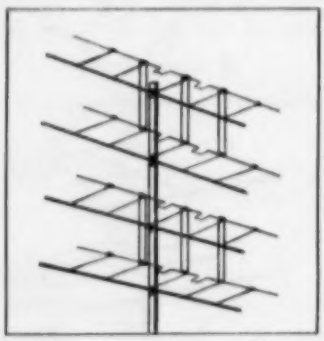


Vee-D-X Ultra Q-Tee (LaPointe-Plascomold Corp., Rockville, Conn.) $29.55.

A two-bay antenna of average construction and performance, judged suitable for areas of medium signal strength.

Description: Pre-assembled type judged to be of only fair mechanical strength. Ability to withstand wind judged satisfactory. Had separate UHF elements connected to VHF elements through a "printed circuit" coupling device. UHF section not tested. Fairly easy to assemble.

Performance: Fair gain on low and high channels. Front-to-back ratio very good on low channels but only average on high channels. Directivity, fair to good, depending on channel tuned in. **2**



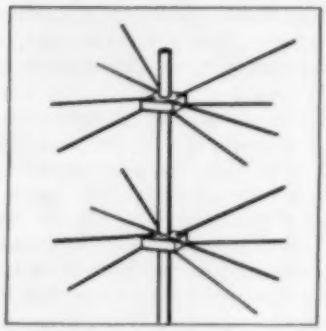
Finco, Type 400 A (Finney Co., Cleveland) $55.

A fairly well performing antenna, but mechanical construction was judged to be only fair.

Description: "Bedspring"-type array judged to be of fair mechanical strength. Ability to withstand wind and vibration judged fair. Pre-assembled type, and ease of final assembly judged satisfactory. UHF-VHF type, but was tested only on VHF.

Performance: Gain on low and high channels, fair. Front-to-back ratio, fair to very good, depending on channel tuned in. **3**

C. Not Recommended

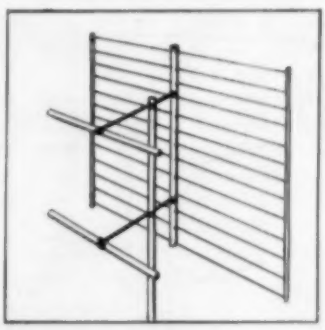


All Channel, Type 150 (All Channel Antenna Corp., 70-07 Queens Blvd., Woodside, N.Y.) $43.50.

This antenna fell below the electrical performance desirable for a fringe-area TV antenna.

Description: Stacked sections each with 8 elements. Each stack was interconnected with a special harness. Special 4-conductor cable used for transmission line. Judged to have fair mechanical strength. Resistance to wind and vibration judged fair.

Performance: Poor gain, poor front-to-back ratio, poor directivity, on all channels. Results of the tests on this antenna do not at least support extreme advertising claims of the manufacturer. **3**



Gonset Radarray, No. 1527 (Gonset Co., Burbank, Calif.) $39.95.

Antenna has fair gain on all channels up to channel 12. Good front-to-back ratio on most channels, but had only fair mechanical construction.

Description: Stacked dipole elements with a large screen-type reflector.

Performance: Gain, fair on low channels, but fell off to poor on high channel 12. Front-to-back ratio, very good on low channels, fair on high channels. Directivity, fair on low, good on high, but fell off at channel 12. Judged to have fair mechanical strength. Ability to withstand wind and vibration judged poor; except for this, would warrant a *B-Intermediate* rating. **3**

Mail-Order Photofinishing Services

The photofinishing services reported here are operated on a low-cost mass-production basis. Results of CR's study show that a reasonable proportion of such companies do a good job in relation to the prices charged. The amateur should bear in mind, however, that if he wants the best possible results, he must do the work himself or send the films to one of the high-grade professional finishers; such superior plants may charge from four or five up to possibly 20 or more times as much for their services, per picture.

MOST amateur photographers take their exposed film to a local agent of a photofinishing company, or mail it to a mail-order photofinisher for processing. Nowadays relatively few persons except the real devotees of amateur photography take the time and trouble to process and print their own films.

The modern photofinishing plant uses automatic machinery which can process enormous amounts of film. (One of the largest photofinishing firms processes about 27 million snapshots a year.) While the printing machines do adjust themselves to compensate for variations in negative density (due to conditions under which the amateur exposed the film), the pictures the commercial photofinisher supplies are often of low quality, compared to what *could* be obtained by a commercial photographer trying to get the best possible picture from a given negative or by the amateur doing his own processing—assuming that he were a careful and fairly expert worker, having the time and patience to do a good job. Quite often, the pictures processed by a commercial photofinisher have too much or too little contrast. An expert worker could get better results with proper attention to developing and by choosing a printing paper of the correct grade or contrast for each negative. However, many amateur photographers are satisfied with average or low quality pictures, and others do not know what grade of work they should be able to obtain for the price charged. Very possibly the average photofinisher will turn out as good prints as the average amateur would.

In order to determine the quality of service offered the amateur photographer at low prices, Consumers' Research sent films to 14 mail-order finishers, mostly firms that advertise in various magazines and have shops in a number of states of the union. All films were exposed in the same camera under as nearly identical conditions as possible. On each film, some pictures were taken in the sun and some in the shade at the correct exposure, and some pictures on each roll were greatly overexposed and underexposed. When the negatives and prints were returned, they were carefully examined. The faults most often found were scratched and spotted negatives, and prints of poor contrast.

In CR's previous examinations of work done by commercial photofinishers, the negatives often were very poor; some were bulged or buckled from overheating in the drying process. Some were dirty or scratched, or carelessly cut from the roll so as to lose part of a negative. Sometimes prints were dirty or showed specks in the gloss. Occasionally, prints were not sharp owing to defects (vibration, lens out of focus, etc.) in the printing or enlarging equipment. In

The spots in the lower right corner of this picture are the result of carelessness on the part of the photofinisher.

these respects, the photofinishers listed below did a fairly good job on the whole, and a few did very well. In no case were the negatives in the present study badly buckled or bulged, and most prints were reasonably sharp.

Most of the photofinishers make slight enlargements as a normal service, although contact prints can usually be obtained on request. There is always some loss of picture sharpness in the enlarging process, no matter how careful the workmanship, but with the usual 1½ times enlargements, the loss of definition should not be enough to be noticeable. The critical consumer should bear in mind that occasionally sloppy processing may produce very fuzzy-looking enlarged prints even from excellent sharp negatives.

Prices given are for developing and printing a No. 620 or 120 roll of film with eight exposures, negative size 2¼ x 3¼ inches. In most cases, about 50 percent more is charged for a 12-exposure roll. Prints were on glossy paper, except one set returned from Edwards (see listing). Except as noted, prints were furnished loose. The others were in binders. The pictures returned from Tower and Wardway had the month and year of the processing neatly printed photographically in small letters in the margin of each print, a feature that many would appreciate. The reference to "condition of negatives and prints" refers primarily to the negatives; the prints themselves were pretty generally free from defects.

A. Recommended

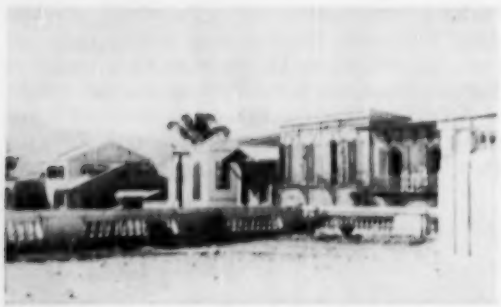
Tower Personalized Photo Service, P.O. Box 755, Chicago 42. 45c. Print size, 3 x 4½ in. Condition of negatives and prints, good. Sharpness and contrast of prints, good. Results were consistently good on several lots (more than a dozen rolls of film).

• • •

The following group of photofinishers did work almost equal to Tower in quality.

Eastman Kodak Stores, Inc., 20 E. 45 St., New York 17. 76c. Print size, 2¼ x 3¼ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, good.

Wardway Photo Service, Park Ridge, Ill. 40c. Print size, 3 x 4½ in. Condition of negatives and prints, good. Sharpness of prints, good; contrast, fairly good. Prints bound in folder.



a

b

c

Pictures **a** *and* **c** *were made by a commercial photofinisher. Pictures* **b** *and* **d** *were made by Consumers' Research from the same negatives used by the photofinisher, but CR used a paper of a contrast grade more suited to the contrast of the negatives in order to bring out the mountains in the background and improve the rendering of detail in the foreground.*

d

Willoughby's, 110 W. 32 St., New York 1. 85c. Print size, 2⅛ x 3⅛ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, good. Prints bound in folder.

B. Intermediate

Crown Photo Service, P.O. Box 392, Augusta, Ga. 40c. Print size, 3 x 4½ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, fairly good.

Envoy Photo, Box 121, Bath Beach Station, Brooklyn 14, N.Y. 40c. Print size, 3 x 4½ in. Condition of negatives, fair; prints, good. Prints from one roll were definitely unsharp (though the definition of the images on the negatives was excellent). Contrast of prints, good. Prints bound in folder.

DeLuxe Film Service, Shreveport, La. 35c. Print size, 3 x 4½ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, fair.

Edwards Fine Grain Laboratory, Inc., Box XX, Chicago 90. $1.24. Print size, 2 x 3⅛ in. Condition of negatives, fair; prints, good. Sharpness and contrast of prints, fairly good. One roll was returned with semi-matte prints of very good quality, worthy of an *A-Recommended* rating.

Hagner Photo Service, 1318 W. Columbia Ave., Philadelphia 22. 40c. Print size, 3½ x 5¾ in. Condition of negatives and prints, fair; sharpness and contrast of prints, fairly good.

Perfect Film Service, Box 668, La Crosse, Wis. 40c. Print size, 3½ x 5⅝ in. Condition of negatives, fair; prints, good. Sharpness of prints, good; contrast, fair.

Rhodus Photo Finishing Co., P.O. Box 388, Kansas City 41, Mo. 56c. Print size, 3 x 4½ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, fair.

Western Photo Service, Box 298, San Francisco 1. 40c. Print size, 3 x 4½ in. Condition of negatives and prints, fairly good. Sharpness and contrast of prints, fairly good. One roll was returned with 2⅛ x 3⅛ in. prints of good quality, worthy of a low *A-Recommended* rating.

C. Not Recommended

Eastman Studio, Bode, Iowa. (Not Eastman Kodak Company or Eastman Kodak Stores, Inc.) 30c. Print size, 2⅛ x 3⅛ in. Condition of negatives and prints, poor. Sharpness and contrast of prints, fairly good.

National Photo Laboratories, New Hyde Park, N.Y. 85c. Print size, 2¾ x 4 in. Condition of negatives and prints, fair. Sharpness of prints, fairly good, but contrast was poor.

"All About Trailers"—a book review

THOSE interested in buying and using a trailer will find that Mr. John Gartner's book All About Trailers is very informative. The book has 18 chapters and 152 pages that will answer many questions about trailers. Such subjects as towing, building and buying, cleanliness, and the requirements of a sportsman's trailer are discussed.

Trailering has many advantages, but Mr. Gartner notes that everything is not sweetness and light. A trailer can be moved on short notice, but parking and traffic difficulties may be encountered. Travel with a trailer is inexpensive, yet the initial cost of the trailer plus insurance and license fees involve substantial items of expense. The author, a trailer enthusiast, feels that the advantages far outweigh the disadvantages.

He discusses the type and size that would best suit a user's needs, stating that, for full-time living in a trailer, the largest mobile home is none too big. For a vacation trailer, not over 18 to 20 feet is preferred for practical mobility.

About half the initial cost of a trailer can be saved by building one's own. However, Mr. Gartner suggests that building should be considered *only* by a man who is a *good craftsman* with both metal and wood. If a used trailer is considered, one should be sure to examine it very closely, especially the roof. The author notes that more "headaches" come from a leaky trailer roof than any other single factor. Mr. Gartner says it would be wise for a prospective purchaser to rent a trailer for a week or two and give it a try. If this trip is enjoyable, he can go ahead and purchase or build with confidence.

According to the book, keeping clean is something of a problem because of space limitations and other problems, except in the largest size trailers. The vacation trailer sanitation problem is still unsolved, the best systems being rather crude. There is a wide range of accessory equipment made specifically for trailers nowadays, but a lot of it is impractical for travel.

The author, in considering the sportsman, regards the small cabin-type trailer best for him —about 1500 pounds loaded, 14 to 16 feet in over-all length.

The book is well written; it is published by Henry Holt & Company, New York, at $2.75.

The Ball-Point Pencil

and a fountain pen with a new feature

THE latest thing in writing supplies is a ball-point "pencil," the first of which arrived on the market in February. The Parker Pen Co. was the first to advertise the liquid-lead pencil, but only Scripto's *Fluidlead* (Scripto, Inc., Atlanta, Ga., 49 cents) was actually available on the market early enough to be included in this test. Parker's ball pencil was recently introduced at $3.95.

CR's staff tested and used a number of these *Fluidlead* pencils and found them a good deal less exciting in their performance than the advertising indicated. They have as many disadvantages as advantages, when compared to either regular graphite pencils or ball-point pens. Two of these pencils gave 4700 and 1600 feet of writing from their cartridges—which would seem to be a much greater variation than good quality control in manufacture should permit. Two of the 25-cent *Fluidlead* refill cartridges tested were removed from CR's writing machine after about 4000 and 8000 feet of writing. Both were still writing, but the written lines had gradually become so weak that most persons would have long since discarded the refills. Thus the *Fluidlead's* writing capacity may be from one to four or five times that which would be given by one ordinary medium-soft lead pencil, considering that a lead pencil will show great variations in amount of writing, depending on how often it is sharpened (as determined by the sharpness of the point the user prefers) and how short a stub of pencil is used. Those who like a sharp pointed pencil will use up much more of a regular lead pencil in the pencil sharpener than on the paper.

As the *Fluidlead* never needs sharpening—the point doesn't break or wear down, but is replaced when the cartridge is exhausted — one needn't make frequent trips to the pencil sharpener or be caught with a broken pencil and no sharpener or penknife handy. For some, the *Fluidlead* cartridges may outlast several ordinary pencils, but we judge that the average writer will probably get about as many words from two or three 5-cent pencils as from the 25-cent *Fluidlead* refill. Furthermore, the *Fluidlead* writing does not erase as cleanly as a regular lead pencil, even with greater erasing effort. The writing, though

At the top is shown a regular lead pencil; next is the VELVET Ball PEN-cil; and under that the Scripto Fluidlead ball-point pencil.

similar in color to ordinary pencil marks, is often decidedly on the pale gray side, and it has the unevenness and splotchiness that is characteristic of ball pens.

Actually, the *Fluidlead* is nothing more than an inexpensive ball pen without the advantages of a retracting point or cap over the point, but with an "ink" that is at least partially erasable on paper and can be washed out of clothing much more easily than ordinary ball-pen inks. Although news releases indicate the ball pencil is selling well, CR believes it to be more of a novelty capable of making a lot of money for its promoters than an important writing instrument having new and different properties from the usual ball-point pen.

As may be expected when a new product is announced, others are quick to follow with a similar idea. There are now about nine makes of ball-point "pencils" being sold, and the American Lead Pencil Co. has come up with what it calls the *VELVET Ball PEN-cil*, which is merely a ball pen that uses colored ink, and *looks* like a pencil (see illustration). The manufacturer recognizes its kinship to ball pens by referring to the writing fluid as ink, and by announcing a liquid lead pencil to be available soon. The *Ball PEN-cil* uses a regular ball-pen ink, available in four colors, but refill cartridges cannot be used. The so-called *Ball PEN-cil* costs 29 cents and gives

about 10,500 feet of writing; its economy in use was thus better than the *Fluidlead*.

Scripto pen's new feature

Another new item which may be of interest is the *Scripto Ink Reserve Fountain Pen* (Scripto, Inc., $1). CR has tried several of these pens and found them to be attractive and smooth-writing. They have plastic barrels and side-lever fillers. In the ink reservoir is a sponge which absorbs and holds some of the ink. When the pen seems to have run dry, the lever is operated to squeeze the ink out of the sponge so that more writing can be done. Thus, the writer has a warning before he runs out of ink completely. Of two pens tested, one gave about 1200 feet of writing per filling but had no "reserve"; the other wrote about 700 feet until apparently out of ink, and then wrote an additional 200 feet on the reserve supply.

Caulking Compounds

CAULKING a thin crack around a window frame or an outside door frame to keep out cold air and water has become a common job for the do-it-yourself homeowner. There are many different kinds of compounds available for the job. Some are applied like putty with a putty knife or other blunt tool; others are applied with a pressure gun which "squirts" the semi-plastic material into the crack.

CR chose for test a number of brands of each kind and tested each for its ability to adhere to different combinations of wood, brick, and metal which might be employed in modern home construction. Shrinkage, tendency to harden with time, and cracking tendency were evaluated by using the different products in a specially constructed test frame in which clearance spaces or cracks filled with the compounds were changed

Chart Showing Results of Tests on Caulking Compounds

Brand		*Durability of Bond (primed surfaces)*				*Durability of Bond (unprimed surfaces)*				*Rating*
		wood to wood	*wood to metal*	*wood to brick*	*brick to metal*	*wood to wood*	*wood to metal*	*wood to brick*	*brick to metal*	
Carey	E	S	S	S	S	S	S	S	S	A
	F	S	S	S	S	S	S	S	S	
Caulk-O-Seal	E	120	S	—	500	—	S	—	—	C
	F	150	S	145	—	120	S	145	500	
Cold-Bar	E	—	—	—	—	—	—	—	—	C
	F	120	150	145	150	120	150	145	150	
Kalk-Kord	E	125	120	—	—	120	120	—	—	C
	F	150	150	145	150	145	150	145	150	
Kaukit	E	150	120	—	S	150	120	—	—	B
	F	500	145	500	S	500	145	145	500	
Master-Caulk	E	—	145	—	—	—	120	—	—	C
	F	120	150	145	145	120	150	145	145	
Master-Mix	E	125	145	—	S	—	125	—	S	C
	F	145	150	145	S	120	145	145	S	
Vulcatex	E	S	S	S	S	500	S	—	S	A
	F	S	S	S	S	—	S	145	S	

Figures indicate approximate number of days before cracking (E) started or failure of bond (F) occurred.
S—satisfactory, no failure.
A dash (—) indicates that (1) initial cracking was not noted in any examination made prior to failure of the bond (E row) and (2) that failure of the bond had not occurred at the end of the test period, though incipient cracking was noticed (F row).

in width gradually with time so as to simulate the usual changes in space or crack opening with changing seasons.

Since a caulking compound is usually expoced to the weather in actual use, the different samples were exposed out of doors for a considerable length of time and examined periodically for signs of failure. After a year and a half, a majority of the samples had failed, and the test was terminated.

Because of the long time needed to run the tests, it was necessary to purchase the test samples more than two years ago; very possibly some of the products may have been changed by their manufacturers since our purchases were made. It is believed, however, that those products which CR found to have desirable lasting qualities without indications of major failure are pretty likely to be still available and of the same composition as at the time the test was begun.

A. Recommended

Carey Caulking Cement (The Philip Carey Mfg. Co., Cincinnati 15) $5 per gal. Knife grade. Satisfactory life in all test applications (see table). **2**

Vulcates Elastic Caulking Compound (A. C. Hann Co., Long Island City, N.Y.) 51c per gun refill. Gun grade. Satisfactory life in nearly all test applications. **2**

B. Intermediate

Kaukit Elastic Caulking and Glazing Compound (L. Sonneborn Sons, Inc., New York City) $1.15 per qt. Gun grade. Satisfactory life if surfaces are first given a prime coat (CR used *Calbar Caulk Prime*). **2**

C. Not Recommended

Cold-Bar Plastic Caulking Compound (Calbar Paint & Varnish Co.) 89c per qt. Knife grade. Useful life was short, in CR's test. **1**

Master-Mixed Glazing Compound (Sears-Roebuck's Cat. No. 3469) 75c, plus postage, per qt. Knife grade. Described as suitable "for all caulking and window-glazing." Useful life was short in CR's test in most applications (see table). **1**

Caulk-O-Seal Plastic Caulking Compound (Calbar Paint & Varnish Co., Philadelphia) $1.20 per qt. Knife grade. Useful life was short in most applications. **2**

Master-Caulk Plastic Caulking Compound (Calbar Paint & Varnish Co.) $1.08 per qt. Knife grade. Useful life was short, in CR's test. **2**

Kalk-Kord (Sears, Roebuck & Co., Chicago) 29c, plus postage, per 15-ft. roll. A similar product is listed in the current cat. at 89c, plus postage, for a 60-ft. roll. Hand or knife application. Useful life was short, in CR's test. **3**

Corrections and Emendations to Consumers' Research Bulletins

Medium-Fidelity Phonographs
Page 25, Col. 1
Nov. '54 Bulletin

The tone control used on the *Magnavox Playfellow* did not comprise separate bass and treble controls, as the listing indicated, but was rather a single control which functioned mainly to afford a slight increase or decrease of the treble response of the amplifier.

Ladies' Wrist Watches
Page 14
Nov. '54 Bulletin

The rating of *Gruen* watches should be changed to *B. Intermediate*. Subsequent to the accuracy tests performed by CR (in which *Gruen* watches gave good performance), reliable evidence has been received that watches of this make have been giving difficulty because of looseness or pulling out of winding stems.

Diapers
Page 21, Col. 2
Mar. '55 Bulletin

The *Rubens* knit diaper listed under *B. Intermediate* is now sold by Spiegel as Cat. No. 2819, at $2.98 a dozen, plus postage, according to information received from the manufacturer, Rubens & Marble, Inc. The price rating is now **2** (instead of **3**). (Montgomery Ward until recently sold the diaper at $3.15, plus postage, not at $3.95, the figure reported in the original BULLETIN article.)

Ratings of Motion Pictures

THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines—some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, Cue, Daily News (N. Y.), *The Exhibitor, The Farm Journal, Films in Review, Harrison's Reports, Joint Estimates of Current Motion Pictures, Motion Picture Herald, National Legion of Decency, Newsweek, New York Herald Tribune, New York Times, Parents' Magazine, Release of the D. A. R. Preview Committee, Reviews and Ratings* by the Protestant Motion Picture Council, *The Tablet, Time, Variety* (weekly).

The figures preceding the title of the picture indicate the number of critics whose judgments of its entertainment values warrant a rating of A (recommended), B (intermediate), or C (not recommended).

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adv—adventure
biog—biography
c—in color (Ansco, Eastman, Technicolor, Trucolor, Warner Color, etc.)
cr—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy
hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
nov—dramatization of a novel
rom—romance
sci—science fiction
soc—social problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wes—western

A	B	C		
—	5	3	**Abbott and Costello Meet the Keystone Kops**	*com AYC*
—	3	12	**Adventures of Hajji Baba, The**	*adv-c A*
—	1	5	**Affairs of Messalina, The (Italian)**	*hist-dr A*
—	7	6	**Africa Adventure**	*trav-c AYC*
—	8	4	**Americano, The**	*mel A*
—	4	—	**An Annapolis Story**	*war-dr-c AYC*
—	5	3	**An Inspector Calls (British)**	*mys-mel A*
—	4	—	**Angelika (German)**	*dr A*
2	9	2	**Animal Farm**	*car-c AY*
—	12	4	**Athena**	*mus-com-c AY*
—	2	7	**Atomic Kid, The**	*com A*
5	9	2	**Bad Day at Black Rock**	*soc-dr-c A*
—	2	7	**Bamboo Prison, The**	*war-dr A*
4	5	10	**Barefoot Contessa, The**	*dr-c A*
1	9	6	**Battle Cry**	*war-dr-c A*
—	7	2	**Battle Taxi**	*war-mel AY*
—	11	2	**Beachcomber, The (British)**	*mel-c A*
4	13	2	**Beau Brummell**	*hist-dr-c A*
—	6	3	**Belles of St. Trinian's, The (British)**	*com A*
—	7	8	**Bengal Brigade**	*mel-c AY*
—	—	3	**Big Chase, The**	*cri-mel A*
—	4	7	**Big Combo, The**	*cri-mel A*
—	3	4	**Big House, U.S.A.**	*cri-mel A*
—	5	7	**Black Dakotas, The**	*hist-mel-c AY*
—	9	6	**Black Knight, The (British)**	*adv-c AYC*
—	2	6	**Black 13 (British)**	*cri-mel A*
—	6	8	**Black Tuesday**	*mel A*
—	12	4	**Black Widow**	*mys-mel A*
2	7	3	**Blackboard Jungle, The**	*soc-dr A*
1	6	2	**Bob Mathias Story**	*biog AYC*
—	2	3	**Bowery to Bagdad**	*com A*
—	10	2	**Bread, Love and Dreams (Italian)**	*com A*
7	10	1	**Bridges at Toko-Ri, The**	*war-dr-c A*
—	1	7	**Cannibal Attack**	*mel-c AYC*
—	4	1	**Canyon Crossroads**	*mel AYC*
—	8	2	**Captain Lightfoot**	*adv-c A*
6	7	6	**Carmen Jones**	*mus-mel-c A*
—	—	3	**Carolina Cannonball**	*com A*
—	6	8	**Cattle Queen of Montana**	*wes-c AYC*
—	1	2	**Cavalcade of Song (Italian)**	*mus-dr A*
—	2	4	**Chance Meeting (British)**	*dr A*
1	6	2	**Chief Crazy Horse**	*mel-c AYC*
2	6	3	**Cinerama Holiday**	*trav-c AYC*
—	1	2	**City Stands Trial, A (Italian)**	*cri-mel A*
1	2	1	**Conquest of Space**	*sci-c A*
7	9	1	**Country Girl, The**	*dr A*
—	3	3	**Crashout**	*mel A*
—	10	7	**Crest of the Wave (British)**	*war-dr AYC*
—	5	4	**Cry Vengeance**	*cri-mel A*
—	3	1	**Cult of the Cobra**	*mel A*
1	6	2	**Day of Triumph**	*dr-c A*
4	8	6	**Deep in My Heart**	*mus-biog-c A*
3	7	7	**Désirée**	*hist-dr-c A*
—	2	4	**Desperate Decision (French)**	*dr A*
—	—	3	**Desperate Women, The**	*soc-dr A*
—	5	5	**Deatry**	*wes-c A*
1	9	6	**Detective, The (British)**	*mys-mel A*
—	1	8	**Devil's Harbor (British)**	*mel AYC*
1	11	4	**Doctor in the House (British)**	*com-c A*
—	9	2	**Down Three Dark Streets**	*cri-mel AY*
—	8	6	**Drum Beat**	*mel-c AY*
6	4	3	**East of Eden**	*dr-c A*
—	11	3	**Far Country, The**	*mel-c A*
—	2	3	**Fast and the Furious, The**	*mel A*
—	3	10	**Fire Over Africa**	*mys-mel-c AY*
—	6	8	**Four Guns to the Border**	*wes-c A*
—	2	3	**Four Ways Out (Italian)**	*cri-mel A*
—	6	—	**Fuss Over Feathers (British)**	*war-dr AY*
—	5	6	**Game of Love (French)**	*dr A*
—	3	2	**Gangbusters**	*cri-mel A*
—	1	3	**Garden of Eden**	*dr-c A*
7	2	2	**Gate of Hell, The (Japanese)**	*dr-c A*
2	9	3	**Glass Slipper, The**	*mus-fan-c AYC*
—	7	7	**Golden Mistress, The**	*mel-c A*
—	3	8	**Good Die Young, The (British)**	*cri-mel A*
—	12	3	**Green Fire**	*dr-c A*
—	7	4	**Green Scarf, The (British)**	*mys-mel A*
—	1	3	**Half a Century of Songs (Italian)**	*mus-dr-c A*
—	2	1	**Half Way to Hell**	*war-doc A*
2	13	4	**Hansel and Gretel**	*mus-fan-c AYC*
—	4	6	**Heart of the Matter, The (British)**	*dr-c A*
1	2	1	**Heartbreak Ridge**	*war-dr-c A*
—	1	2	**Heat Wave (British)**	*cri-mel A*
—	6	2	**Hello Elephant (Italian)**	*com A*
1	3	—	**Hell's Gate (Japanese)**	*dr-c A*
—	4	6	**Hell's Outpost**	*mel A*

A	B	C		
1	6	6	**Hit the Deck**	*mus-com-c A*
1	9	1	**Holiday for Henrietta (French)**	*com A*
—	12	4	**Human Jungle, The**	*cri-mel A*
1	9	1	**Hunters of the Deep**	*doc-c AYC*
—	2	6	**Illicit Interlude (Swedish)**	*dr A*
—	1	3	**Imposter, The (Japanese)**	*dr A*
—	7	1	**Innocents in Paris (British)**	*com A*
2	3	—	**Interrupted Melody**	*mus-biog-c A*
—	8	1	**Intruder, The (British)**	*war-dr A*
—	1	2	**It Came from Beneath the Sea**	*sci AY*
—	—	4	**Jail Bait**	*cri-mel A*
—	—	9	**Jesse James' Women**	*mus-wes-c A*
—	1	2	**Jungle Gents**	*com AYC*
—	—	3	**Jungle Moon Men**	*adv AYC*
2	7	5	**Jupiter's Darling**	*mus-com-c A*
—	2	1	**Karamoja**	*doc-c A*
—	—	3	**Killer Leopard**	*mel AYC*
—	4	3	**Land of Fury (British)**	*dr-c A*
1	10	4	**Last Time I Saw Paris, The**	*dr-c A*
—	1	4	**Lawless Rider, The**	*wes AYC*
—	7	1	**Life in the Balance, A**	*mel A*
—	2	1	**Littlest Outlaw, The**	*dr-c AY*
4	11	2	**Long Gray Line, The**	*dr-c AYC*
1	3	2	**Long John Silver**	*adv-c A*
—	8	4	**Lovers, Happy Lovers (British)**	*dr A*
—	4	3	**Ma and Pa Kettle at Waikiki**	*com AYC*
—	3	3	**Mambo (Italian)**	*mus-dr A*
3	5	—	**Man Called Peter, A**	*biog-c AYC*
—	9	2	**Man Without a Star**	*wes-c A*
—	7	5	**Many Rivers to Cross**	*mel-c A*
2	4	—	**Marty**	*dr A*
—	4	4	**Masterson of Kansas**	*wes-c AYC*
—	2	2	**Mlle. Gobette (Italian)**	*com A*
—	1	2	**Murder is My Beat**	*cri-mel A*
—	2	4	**Naked Heart, The (Canadian)**	*dr A*
—	2	6	**New Orleans Uncensored**	*mel A*
—	6	6	**New York Confidential**	*cri-mel A*
—	4	4	**One Summer of Happiness (Swedish)**	*dr A*
—	9	1	**Operation Manhunt**	*mys-mel AYC*
1	3	1	**Othello**	*dr A*
—	2	7	**Other Woman, The**	*mel A*
—	3	5	**Outlaw's Daughter, The**	*wes-c A*
—	—	3	**Paid to Kill (British)**	*mys-mel A*
—	1	13	**Passion**	*mel-c A*
—	—	3	**Phantom Stallion**	*wes AYC*
1	9	7	**Phffft**	*com A*
—	4	5	**Pirates of Tripoli**	*adv-c A*
—	4	3	**Port of Hell**	*mel A*
4	8	4	**Prince of Players**	*biog-c A*
—	4	7	**Private Hell 36**	*mel A*
—	4	2	**Purple Plain, The (British)**	*war-dr-c A*
2	5	1	**Quest for the Lost City**	*doc-c AYC*
—	9	8	**Racers, The**	*mel-c A*
—	5	1	**Rage at Dawn**	*mel-c AYC*
—	2	3	**Revenge of the Creature**	*mel AYC*
—	3	6	**Ricochet Romance**	*com AYC*
—	7	9	**Rogue Cop**	*cri-mel A*
15	2	1	**Romeo and Juliet (Italian)**	*dr-c AY*
—	5	4	**Roogie's Bump**	*fan AYC*
—	5	2	**Run for Cover**	*mel-c A*
—	—	6	**Sabaka**	*mel-c A*
—	4	5	**Seven Angry Men**	*hist-dr A*
—	5	7	**Shanghai Story, The**	*mys-mel A*
1	10	4	**Sign of the Pagan**	*hist-dr-c A*
1	5	8	**Silver Chalice, The**	*dr-c A*
—	—	3	**Simba (India)**	*dr-c A*
1	6	8	**Sitting Bull**	*hist-mel-c AY*
1	8	6	**Six Bridges to Cross**	*cri-mel A*
—	4	2	**Sleeping Tiger, The (British)**	*mel A*
—	7	3	**Smoke Signal**	*wes-c AYC*
—	—	5	**Snow Creature**	*sci AY*
—	10	4	**So This is Paris**	*mus-com-c A*
—	3	—	**Souls in Conflict**	*doc-c AY*
—	3	—	**Square Ring, The (British)**	*mel A*
10	3	3	**Star is Born, A**	*mus-dr-c A*
—	4	6	**Steel Cage, The**	*biog AYC*
—	5	—	**Stranger on Horseback**	*mel-c AYC*
—	6	3	**Stranger's Hand, The (British-Italian)**	*mys-mel A*
1	3	—	**Strategic Air Command**	*war-dr-c AYC*
—	—	4	**Sunderin (German)**	*dr A*
—	1	5	**Target Earth**	*sci A*
—	1	6	**Tarzan's Hidden Jungle**	*adv A*
—	4	5	**Ten Wanted Men**	*wes-c A*
—	1	3	**Tender Hearts**	*dr A*
—	1	2	**Texas Bad Man**	*mel AYC*
—	4	4	**Theodora, Slave Empress (French-Italian)**	*hist-dr-c A*
5	6	6	**There's No Business Like Show Business**	*mus-com-c A*
—	6	4	**They Rode West**	*wes-c AYC*
—	4	2	**They Were So Young**	*soc-dr A*
—	2	13	**This is My Love**	*dr-c A*
—	3	3	**Three Cases of Murder (British)**	*cri-mel A*
—	4	11	**Three for the Show**	*mus-dr-c A*
—	6	6	**Three Hours to Kill**	*mel-c A*
2	8	5	**Three Ring Circus**	*com-c AYC*
—	8	1	**Tight Spot**	*cri-dr A*
—	4	3	**Timberjack**	*mus-mel-c AYC*
—	4	2	**To Paris With Love (British)**	*com-c A*
—	2	6	**Tobor, the Great**	*sci-mel AY*
—	7	4	**Tonight's the Night (British)**	*com-c A*
—	7	12	**Track of the Cat**	*dr-c A*
—	2	3	**Treasure of Ruby Hills**	*wes AYC*
—	5	3	**Trouble in Store (British)**	*com AYC*
—	4	4	**Trouble in the Glen (British)**	*com-c AYC*
—	1	3	**True and the False, The (Swedish)**	*dr A*
7	5	1	**20,000 Leagues Under the Sea**	*adv-c AYC*
—	3	8	**Twist of Fate**	*mys-mel A*
—	1	3	**Two Guns and a Badge**	*wes A*
2	8	3	**Ugetsu (Japanese)**	*dr A*
2	12	1	**Unchained**	*soc-dr A*
1	9	6	**Underwater!**	*mel-c A*
—	1	8	**Unholy Four, The (British)**	*mys-mel A*
—	4	6	**Untamed**	*mel-c A*
—	1	2	**Varietease**	*com A*
1	8	5	**Vera Cruz**	*mel-c A*
1	9	5	**Violent Men, The**	*mel-c A*
—	—	3	**Voice of Silence, The (Italian)**	*dr A*
1	6	5	**Wages of Fear, The (French)**	*propaganda-dr A*
—	4	—	**Welcome the Queen**	*doc-c AYC*
1	9	4	**West of Zanzibar (British)**	*mel-c AYC*
—	8	2	**White Feather**	*wes-c A*
—	1	6	**White Fire (British)**	*mel A*
—	4	5	**White Orchid, The**	*adv-c A*
2	10	5	**Woman's World**	*dr-c A*
—	5	8	**Women's Prison**	*soc-dr A*
—	2	2	**World Dances, The**	*mus-doc-c AYC*
—	3	4	**Wyoming Renegades**	*wes-c A*
—	2	8	**Yellow Mountain, The**	*wes-c A*
—	—	5	**Yellowneck**	*war-dr-c A*
—	3	1	**You Know What Sailors Are (British)**	*com-c A*
1	10	3	**Young at Heart**	*mus-com-c A*
—	1	2	**Yukon Vengeance**	*mel AYC*

The Consumers' Observation Post

(*Continued from page 4*)

for a judgment and costs against the corporation for 14 violations of the 1940 Trade Commission Act. These kitchen utensils were the subject of the Federal Trade Commission's Cease and Desist Order in 1940. At that time they were sold under the trade name Silver Seal and were, according to the F.T.C.'s complaint, made chiefly of aluminum and thus would pit as readily as utensils manufactured by the firm's competitors. The so-called waterless cooking method advocated at that time by the salesmen of Silver Seal is a technique that can be used with any thick-walled cooking vessel, and it has no special merit for conserving food values.

* * *

SPRAYING THE LAWN WITH 2,4-D to kill dandelions should be done with care. One suburbanite took great pains not to allow such a spray to get on his wife's flowers and vegetables, but when he finished spraying, he threw the empty container of the concentrate near the garbage can and enough fumes remained to ruin the tomato plants in the near-by garden. Vapors as well as spray must be guarded against in the use of 2,4-D and similar materials, for drift of spray and fumes is easily caused by air movements.

* * *

FOOD-FREEZER PLAN SELLING is under fire in many sections of the country for misleading advertising and misrepresentation of the benefits to be derived from such plans. The St. Louis Better Business Bureau has done some excellent work in exposing misleading claims that food is being sold at wholesale, that a freezer will pay for itself out of savings on food purchases, that food bills will be cut by any definitely stated amount, and that the purchaser will secure his freezer free of charge. The Federal Trade Commission recently wound up proceedings against the National Food Foundation, Inc., of Hartford, Conn., when the latter signed a stipulation agreeing to refrain from making claims that people joining the National Food Foundation Discount Club would receive a freezer without cost. Similar steps were taken by Deep Freeze Appliance Div., Motor Products Corp., Detroit, which agreed to stop representing that savings in food costs would pay for a Deep Freeze home freezer; and by the Rich Plan Corp., of Dallas, Texas, which agreed to stop representing that the Rich Plan afforded tremendous or unbelievable savings in food costs.

* * *

AS THE POISON IVY SEASON APPROACHES, various remedies, lotions, and salves will be tried. One treatment newly discovered has involved the use of corticotropin, cortisone, or other steroid hormones. According to Dr.

Buy wisely to save money

● **Get the real facts about a product before you spend good money for it. The best is not necessarily the most expensive. As CR's tests have shown time and again, a low- or moderate-priced brand may outperform a high-priced one. With CR's professional advice to guide you, you can make your purchases wisely and economically.**

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George E. Morris, Assistant Clinical Professor of Dermatology, Tufts College Medical School, Boston, these "miracle" drugs merely allay a contact dermatitis from poison ivy for three or four days and then when the medication is stopped the dermatitis returns in full force. He reports that in his experience the eruption is harder to clear up than it would have been had such treatment not been administered.

* * *

NEW OR NEWLY TESTED:

Dual Shakers, T Model 200 (Hyland Products, 1010 N.E. 122 Ave., Portland 16, Oreg.), 50 cents each. Designed to provide one shaker for both salt and pepper, one from one side of the shaker. The device was made of colored plastic, with an inside center partition to keep the two condiments separated, with an opening on each side for filling. It could be cleaned and filled easily. As claimed, there were no parts to be removed for filling. The device was only faintly marked for Salt and Pepper (S, P) on the top. It was found quite convenient to use. The bottom was of transparent plastic, to permit one to note easily when either chamber would need refilling.

Windo-Wizard (Rene-Craft Products, Wilmette 44, Ill.), $1. Device for opening stuck windows, consisting of a wooden handle, 8 in. long, to which was attached a thin steel triangular blade with sharp teeth on two sides of the blade. The blade was attached at about a 15-degree angle to the handle by means of three countersunk flat-head screws. The device was found to be effective in cutting through paint to enable windows to be opened without much difficulty, although it took some effort to force the blade through hardened paint and the device might thus not be practical for a woman's use. It could not help much on windows that were stuck because the wood was warped or swollen. The tool should be useful for homeowners with a number of paint-stuck windows if the expense of buying a tool of such a limited function is considered warranted. Carpenters and painters might find it convenient.

"Penthouse" Chromate Shelf, Refrigerator Style No. 1 (Beacon Enterprises; distributed by Goldsmith Bros., 77 Nassau St., New York 7) $2.98, plus postage. Wire rack with suction cups to anchor it firmly, designed to be placed on top of the refrigerator to provide storage area for various items. It was found particularly convenient for things that have to be placed beyond the reach of small children, but which are needed in the kitchen. (One comment was that it might tend to be a catchall because it was so handy.) The device was considered a useful addition for storage space, particularly in a small kitchen.

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Phonograph Records

BY WALTER F. GRUENINGER

Please Note: The first symbol applies to quality of interpretation, the second to fidelity of recording.

Balakirev: *Thamar* & **Liadov:** *Baba-Yaga*, Eight Russian Popular Songs, *Kikimora*. L'Orchestre de la Suisse Romande under Ansermet. London LL 1068. $3.98. Interesting, but not great, Russian orchestral music seldom heard in this country. Extraordinarily well played and recorded. AA AA

Bizet: *The Pearl Fishers*. Alarie, Simoneau, Bianco, Depraz, etc., under Fournet. 4 sides, Epic SC 6002. $9.96. The opera is not as good as *Carmen*, but it offers many delightful moments, and this cast makes the most of them. The singing throughout is admirable. Outstanding recording. Superior to competitive Renaissance Set SX 205. AA AA

Dvorak: *Concerto in B Minor*. Navarra (cello) with the New Symphony Orchestra under Schwarz. Capitol P 8301. $4.98. The piece ranks high among the masterpieces for the cello. Navarra is a little careless with intonation at times, but in most other respects the performance is quite marvelous. Better than the competitive recordings available on Victor, Remington, Westminster. Cello is heard at about the same volume in relation to the orchestra that one hears in a concert hall. A AA

Handel: *Four Concerti Grossi*. Vienna Symphony Orchestra and Concertino under Pritchard. Epic LC 3097. $3.98. From Op. 6 we hear Nos. 1, 7, 2, 6. Rich, healthy, beautiful pieces they are, too. Playing and recording are first rate. An outstanding disk of the month. AA AA

Rachmaninoff: *Concerto No. 2*. Pennario (piano) with the St. Louis Symphony Orchestra under Golschmann. Capitol P 8302. $4.98. Thrilling romantic music of which there is no AA—AA recording available. This one falls short in the climaxes and in the passages which should "melt" the listener. Perhaps this is a case of a young man playing "old fashioned" music in which he does not fully believe. But it is very well recorded and, until a better one comes along, it will do. Overall, the de Groot performance on Epic LC 3009 just about matches it. A AA

Rossini: *L'Italiana in Algeri*. Petri, Sciutti, Valletti, Simionato, etc., under Giulini. 4 sides, Angel 3529-B. $11.90. The Rossini style of *The Barber* and *La Cenerentola* is unmistakable. Some cuts in the performance. The mezzo Simionato sings her difficult music with virtuosity, and all sing with style and enjoyment, though Valletti has trouble with his first scene. In summary, the cast is competent without being distinguished. Lively, tasteful direction. A A

Schumann: *Symphony No. 3* and *Overture, Scherzo, Finale*. Orchestra of the Concerts du Conservatoire under Schuricht. London 1037. $3.98. Schumann's spirit is present in this playing which is never permitted to drag. The "Rhenish" symphony is the more famous piece. As befits so distinguished a performance, the recording is wide range. But rather low volume. . . .Superior performance of *No. 3* to the newly released Epic LC 3092, Concertgebouw Orchestra under Zecchi. AA A

Sibelius: *Symphony No. 2*. Members of the NBC Symphony under Stokowski. RCA Victor LM 1854. $3.98. Crystal clear recording of one of Sibelius' most popular symphonies. There's more grandeur in the Koussevitzky performance on RCA Victor LM 1172 which is surprisingly well recorded for an "oldie." The fidelity of the Camden CAL 108 recording also listed sounds poor when compared with these disks. Overall, Stokowski probably offers the best buy. A AA

Tchaikovsky: *The Sleeping Beauty*. Kostelanetz and His Orchestra. Columbia ML 4960. $3.98. Ten listings for *The Sleeping Beauty* ballet in Schwann's catalog utilize two sides or less of an LP. One listing (London LL 636/7) offers 4 sides as the complete ballet. The music that Kostelanetz includes is that most frequently heard. There's nothing particularly outstanding about the performance, though the beat is firm and the orchestra plays well. Excellent recording. If possible, before purchasing compare with London LL 440. A AA

Verdi: *La Traviata*. Tebaldi, Poggi, Protti under Molinari-Pradelli. 6 sides, London LLA 26. $14.94. Verdi's delicate chamber opera is essentially a show piece for the soprano, in this case Renata Tebaldi. She sings magnificently. While no other member of the cast matches her, all are a positive success. So is the direction. With the exception of an occasional fault in balance which puts the soloists too near the mike, the recording is fine. . . .Against this, match the extraordinary but fast conducting of Toscanini with superb principals, but a far less effective recording (RCA Victor 6003—4 sides). Not an easy choice, but all except the devoted Toscanini admirers will probably get more enjoyment out of this London release. AA AA

Broadway '55. Fred Waring and the Pennsylvanians—Glee Club and Orchestra. Decca DL 8099. $3.98. Selections from "Fanny," "Silk Stockings," "House of Flowers." The music is no great shakes but Waring's vocal and instrumental arrangements almost make it seem important. AA AA

Gypsy Nights. Edi Csoka and His Gypsy Orchestra. Vanguard VRS 7019. $3.95. What sets this apart from most records of this genre is the virtuosity of Csoka (violin) and the wide range recording. If you like the gypsy music heard in cafes, this is your meat. AA AA

• • •

CAMDEN RECORDS list at $1.98 for a 12-in. LP. They are a product of RCA, offering under true or fictitious names, recordings that for the most part were previously issued under the Victor label. I have listened to 19 of them. The surface of CAL 163 (*Music for Easter*) was noisy. All other surfaces were quiet. In no case was the fidelity by today's standard judged to be above *B*—most of it would be rated *C*. Here's the run down on what I heard:

The Six Symphonies of Tchaikovsky (CFL 100) are available for $10.98. Single disks, $1.98. If you like Tchaikovsky this is a fairly good buy. Best recorded are Nos. 1 and 6. The performance of No. 6 accents the morbid character of the music. Nos. 1 and 3 are acceptably played but no more than that. The three remaining are well played.

The Heart of the Opera (CFL 101) contains 78 selections from 11 operas on 6 disks, available for $10.98. Single disks, $1.98. These recordings sound like the ones offered about 1940 on 78 rpm. disks by various newspapers to increase circulation. Best sung, and at $1.98 likely to give the budget-minded considerable pleasure, are "Madame Butterfly" and "La Boheme" (CAL 222); "Carmen" and "Faust" (CAL 221). The singers *may* include Tokatyan, Steber, Warren, Dickey.

Richard Crooks Sings Songs of Faith and *Oratorio Arias* (CAL 170) impressed me as best of the remaining disks—very well sung and well enough recorded. Next is John Charles Thomas in *Operatic Arias* and *Operetta Favorites* (CAL 199). In descending order I would follow them with the *Sibelius Symphony No. 2* (CAL 108)—*Lawrence Tibbett Sings Operatic Arias* (CAL 171)—Victor Herbert, featuring Richard Crooks (CAL 228)—and not recommended are *Show Case of Show Tunes*, Vol. 2 (CAL 232)—*Music for Easter* (CAL 163).

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